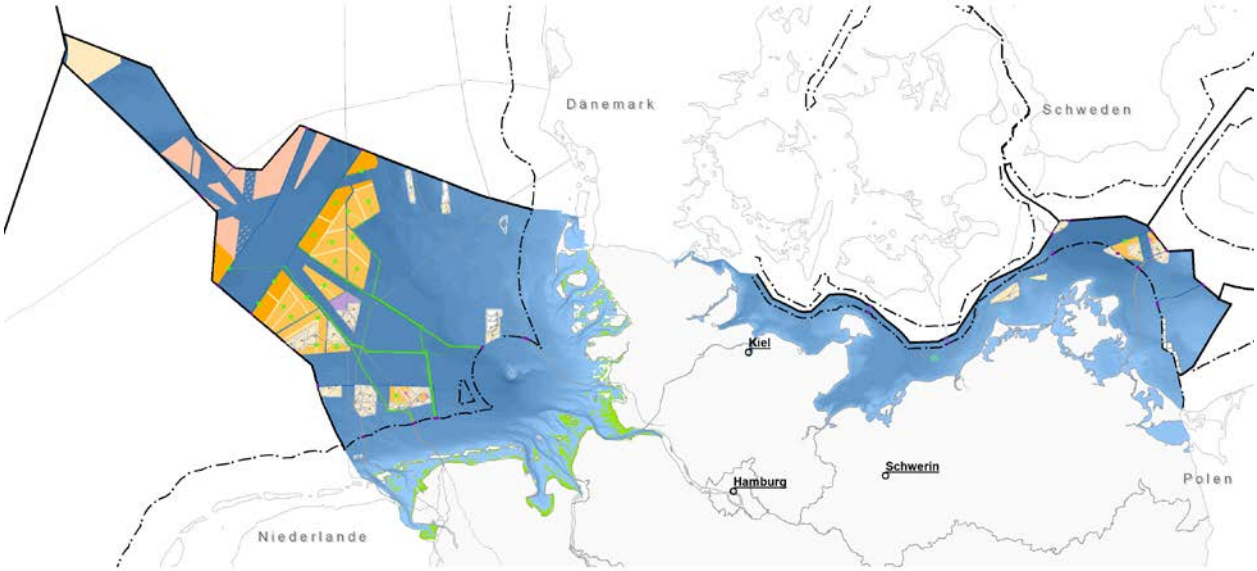
BUNDESAMT FÜR SEESCHIFFFAHRT UND HYDROGRAPHIE

Update and Amendment of the Site Development Plan

Scope for the Strategic Environmental Assessment for the German Exclusive Economic Zone of the North and Baltic Sea

- Draft -



Hamburg, 1st September 2023

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ASCOBANS	Agreement on the conservation of small cetaceans in the North and Baltic Seas
AWZ	Exclusive economic zone
BBergG	Federal Mining Act
BfN	Federal Agency for Nature Conservation
BGBl	Federal Law Gazette
BMUB	Federal Ministry for the Environment, Nature Conservation, Building and Nuclear Safety
BNatSchG	Nature Conservation and Landscape Management Act (Bundesnaturschutzgesetz)
BNetzA	Federal Network Agency for Electricity, Gas, Telecommunications, Post and Railway
BSH	Federal Maritime and Hydrographic Agency
CMS	Convention on the Conservation of Migratory Species of Wild Animals
EEG	Act on the Expansion of Renewable Energies (Renewable Energy Sources Act)
EUROBATS	Agreement on the conservation of European bat populations
R&D	Research and development
FEP	Land development plan
FFH	Fauna- Flora- Habitat
GW	Gigawatt
HELCOM	Helsinki Commission
MARPOL	International Convention for the Prevention of Pollution from Ships
MSFD	Directive 2008/56/EC of the European Parliament and of the Council of 17 June 2008 establishing a Framework for Community Action in the field of Marine Environmental Policy (Marine Strategy Framework Directive)
NSG	Nature reserve
OSPAR	Oslo-Paris Convention (Convention for the Protection of the Marine Environment of the North-East Atlantic)
ROG	Spatial Planning Act
ROP	Spatial development plan
SPEC	Species of European Conservation Concern (Important Species for Bird Conservation in Europe)
StUK4	Standard "Investigation of impacts of offshore wind turbines", status October 2013
SUP	Strategic environmental assessment
SEA Directive	Directive 2001/42/EC of the European Parliament and of the Council of 27 June 2001 on the assessment of the effects of certain plans and programmes on the environment
UBA	Federal Environment Agency
UVPG	Environmental Impact Assessment Act
MSRP	Environmental impact assessment
UVS	Environmental impact study
V-RL	Directive 2009/147/EC of the European Parliament and of the Council of 30 November 2009 on the conservation of wild birds (Birds Directive)
WEA	Wind turbine
WindSeeG	Act on the Development and Promotion of Wind Energy at Sea (Wind Energy at Sea Act)

1 Introduction

A Strategic Environmental Assessment (SEA) is carried out as part of the updating and amendment of the Site Development Plan (FEP). The scope of the SEA, including the scope and level of detail of the information to be included in the environmental report, is defined (cf. Section 39 (1) UVPG).

1.1 Legal basis and tasks of the environmental assessment

In accordance with §§ 4ff. of the Offshore Wind Energy Act (WindSeeG), the BSH prepares an FEP in agreement with the Federal Network Agency (BNetzA) and in consultation with the Federal Agency for Nature Conservation (BfN), the Directorate-General for Waterways and Shipping (GDWS) and the coastal states. The FEP was last updated in 2023. A new update was initiated on 1 September 2023.

During the last amendment/update of the FEP, a detailed environmental assessment was carried out in accordance with the Environmental Impact Assessment Act (UVPG)[1] , the so-called Strategic Environmental Assessment (SEA). The environmental reports were published together with the FEP on 20.01.2023. The necessity of carrying out an SEA with the preparation of an environmental report results from § 35 para. 1 no. 1 UVPG in conjunction with. No. 1.17 of Annex 5, as area development plans are subject to the SEA obligation pursuant to Section 5 WindSeeG. In principle, this also applies if the FEP is updated or amended.

In the context of the update initiated on 01.09.2023, areas and sites are defined for the implementation of the expansion targets in accordance with section 1(2) sentence 1 of the WindSeeG, which go beyond the FEP 2023 and are therefore not covered by the SEA carried out in this procedure.

With the completion of the update procedure for maritime spatial planning, an up-to-date maritime spatial plan (ROP 2021)[2] for the German EEZ of the North Sea and Baltic Sea is available, which came into force on 01.09.2021. The intention is not to plan only in areas designated as priority or reserved areas for wind energy in the ROP 2021. Therefore, a deviation procedure is to be carried out in favour of wind energy within the SN10 designated for shipping.

The SEA for the update of the FEP will continue to be based on the results of the spatial planning in the update procedure and the SEA carried out for previous FEPs: According to § 5 para. 3 p. 4 WindSeeG in conjunction with. § Section 39 (3) sentence 3 UVPG, the SEA to be carried out in the procedure for amending and updating the FEP should be limited to additional or other significant environmental impacts compared to the SEA for the ROP, as well as to necessary updates and deepening.

Pursuant to section 72(1) of the WindSeeG, the assessment of the environmental impact of offshore wind turbines or other energy generation facilities in accordance with the provisions of the UVPG shall be limited to additional or other significant environmental impacts and to necessary updates and deepening on the basis of an SEA already carried out in accordance with sections 5 to 12 in the case of the site development plan or the preliminary investigation.

The SEA for the update of the FEP is based on

[1] Gesetz über die Umweltverträglichkeitsprüfung (UVPG) [Environmental Impact Assessment Act] in the version promulgated on 18 March 2021 (BGBl. I p. 540) last amended by Art. 2 G zur Änd. des RaumordnungsG und anderer Vorschriften [G amending the Regional Planning Act and other provisions] of 22.3.2023 (BGBl. I No. 88).

[2] Ordinance on Spatial Planning in the German Exclusive Economic Zone in the North Sea and the Baltic Sea of 19 August 2021, BGBl. I p. 3886.

the environmental reports for the preparation and update of the FEP from the years 2019, 2020 and 2023. Insofar as new findings on existing determinations should be available and are relevant, these are also taken into account.

In the following, the scope of the assessment is therefore limited to additional or other significant environmental impacts as well as to necessary updates and deepenings resulting both from updated findings and from the updated area map. This follows for the reference to the environmental reports of the spatial development plan from Section 39 (3) sentence 3 UVPG. With regard to the reference to environmental reports on the existing FEP, the aforementioned limitation of the scope of the assessment is based on Section 72 (1) of the WindSeeG.

The objective of strategic environmental assessment according to Art. 1 of Directive 2001/42/EC on the assessment of the effects of certain plans and programmes on the environment (SEA Directive)[3] is to ensure a high level of environmental protection in order to promote sustainable development and to help ensure that environmental considerations are adequately taken into account in the preparation and adoption of plans well before the actual planning of the project.

The SEA has the task of identifying the likely significant environmental effects of implementing the plan, describing them at an early stage in an environmental report and assessing them. It serves to ensure effective environmental precaution in accordance with the applicable laws and is carried out according to uniform principles and with public participation. Pursuant to Article 2 (1) UVPG, the following objects of protection are to be considered:

- people, especially human health,
- animals, plants and biodiversity,
- land, soil, water, air, climate and landscape,
- cultural heritage and other material assets, and
- the interactions between the aforementioned protected interests.

The main content document of the Strategic Environmental Assessment is the environmental report to be prepared. This identifies, describes and evaluates the likely significant effects that the implementation of the FEP will have on the environment, as well as possible planning alternatives, taking into account the essential purposes of the plan (§ 40 UVPG).

1.2 Determination of the scope of the environmental assessment

At the beginning of the implementation of the SEA, the scope, including the required scope and level of detail of the information to be included in the environmental report, is determined (cf. Section 39 (1) EIA Act).

The scope is determined by the legal provisions that are decisive for the decision on the preparation, adoption or amendment of the plan, taking into account Section 33 UVPG in conjunction with Section 2 (1) UVPG. This is limited by the fact that the environmental report only contains the information that can be determined with reasonable effort. It takes into account the current state of knowledge and public statements known to the authority, generally accepted assessment methods, the content and level of detail of the plan and its position in the decision-making process. The authorities whose environmental and health-related area of responsibility is affected by the plan or programme are involved in determining the scope of the Strategic Environmental Assessment

[3] Directive 2001/42/EC of the European Parliament and of the Council of 27 June 2001 on the assessment of the effects of certain plans and programmes on the environment

(OJ L 197 p. 30).

and the scope and level of detail of the information to be included in the Environmental Report (cf. Section 39 para. 4 sentence 1 UVPG). Pursuant to Section 6 (4) sentence 1 WindSeeG, the scope of the assessment is determined on the basis of the results of the hearing.

The present draft assessment framework applies equally to the EEZs of the North Sea and the Baltic Sea. Regionally different bases or methods of SEA are marked accordingly.

1.3 Brief description of the content and the most important objectives of the site development plan

According to § 4 para. 1 WindSeeG, the purpose of the FEP is to make sectoral planning specifications for the exclusive economic zone (EEZ) of the Federal Republic of Germany.

§ Section 4 (2) of the WindSeeG stipulates that the FEP shall make specifications for the expansion of offshore wind energy plants and the offshore connection lines required for this purpose,

- achieve the expansion targets pursuant to § 1 para. 2 sentence 1 WindSeeG,
- expand electricity generation from offshore wind turbines in a spatially ordered and land-saving manner; and
- ensure orderly and efficient use and utilisation of offshore connection lines and plan, construct, commission and use offshore connection lines in synchronisation with the expansion of electricity generation from offshore wind turbines.

In accordance with the legal mandate of § 5 para. 1 WindSeeG, the FEP contains specifications for the period from 2026 for the German EEZ and in accordance with the following provisions for the territorial sea:

1. areas; in the territorial sea, areas can only be designated if the competent Land has identified the areas as a possible subject of the land development plan,
2. sites in the areas determined in accordance with number 1; in the territorial sea, sites may only be determined if the competent federal state has designated the sites as a possible subject of the land development plan,
3. the chronological order in which the defined sites are to be put out to tender in accordance with Part 3 Sections 2, 4 and 5 WindSeeG, including the designation of the respective calendar years as well as the determination of whether the area is to be centrally pre-surveyed,
4. the calendar years including the quarter in the respective calendar year in which the surcharged offshore wind turbines and the corresponding offshore connection line are to be commissioned on the specified sites, as well as the quarters in the respective calendar year in which the cables of the inner park cabling of the surcharged offshore wind turbines are to be connected to the converter platform or the transformer platform,
5. the capacity of offshore wind turbines expected to be installed in each of the defined areas and on the defined sites,
6. Locations of converter platforms, collection platforms and, as far as possible, substations,
7. Routes or route corridors for offshore connection lines,

8. Locations where offshore connection lines cross the boundary between the exclusive economic zone and the territorial sea,
9. Routes or route corridors for interconnectiors,
10. corridors for possible connections between the installations, paths or path corridors referred to in points 1, 2, 6, 7 and 9; and
11. standardised technical principles and planning principles.

For sites in the German EEZ and in the territorial sea, the FEP may designate available grid connection capacities on existing offshore connection lines or on offshore connection lines to be completed in the following years, which may be allocated to pilot offshore wind turbines in accordance with section 95(2) WindSeeG. The FEP may make spatial specifications for the construction of pilot offshore wind turbines in sites and designate the technical conditions of the offshore connection line and the resulting technical requirements for the grid connection of pilot offshore wind turbines.

Pursuant to § 5 para. 2a WindSeeG, the FEP may designate other energy production areas outside of areas.

According to § 3 No. 8 WindSeeG, an other energy production area is an area outside sites on which offshore wind turbines and other energy production facilities, each of which is not connected to the grid, can be erected in spatial coherence. According to § 4 para. 3 WindSeeG, the aim of the designation is to enable the practical testing and implementation of innovative concepts for energy generation not connected to the grid in a spatially ordered and land-saving manner.

In the context of the SEA, a "classic" offshore wind farm is assumed based on the findings to date with regard to electricity generation within the other energy generation areas. Environmental impacts beyond this are highly dependent on the respective use variant and should therefore be comprehensively assessed at the approval level. In this respect, the SEA for other energy generation areas is carried out in the same way as the assessment of areas for offshore wind energy.

Due to the amendment of the EU Renewable Energy Directive (amendment of Directive EU 2018/2001 (RED III)), it should already be taken into account within the framework of forward-looking planning that so-called "acceleration areas" are to be designated in the future as a result of the planned amendment pursuant to Art 15c para. 1 lit. a RED III. The FEP and thus the strategic environmental assessment carried out for this purpose are to form the basis for the designation of the corresponding areas at sea.

2 Relationship with other relevant plans, programmes and projects

The FEP is related to other plans and programmes within the EEZ, in adjacent areas, especially in the territorial sea, and to plans and projects at upstream and downstream planning and approval levels. The implementation of the amended Directive EU 2018/2001 (RED III) may result in changes to the procedure.

2.1 Spatial development plans in adjacent areas

In the interests of coherent planning, coordination processes with the plans of the coastal federal states and neighbouring states are indicated and must be taken into account in the cumulative and, where relevant, transboundary assessment of the impacts on the marine environment. In particular, close coordination with the coastal federal states is necessary with regard to the onshore connection of the offshore wind farms and the routing of the routes through the coastal sea.

2.1.1 Mecklenburg-Western Pomerania

For the state of Mecklenburg-Vorpommern, the highest state planning authority is the Ministry of Economic Affairs, Infrastructure, Tourism and Labour of Mecklenburg-Vorpommern. This is responsible for spatial planning at the state level, including the coastal sea.

The current spatial development programme for Mecklenburg-Western Pomerania (LEP M-V) came into force on 09.06.2016. An update of the LEP M-V is in preparation.

2.1.2 Lower Saxony

The spatial development plan for the state of Lower Saxony, including the Lower Saxony coastal sea, constitutes the Land Spatial Development Programme (LROP). The Lower Saxony Ministry of Food, Agriculture and Consumer Protection, as the highest state planning authority, is responsible for its preparation and amendment; the final decision on the LROP is the responsibility of the state government. The LROP is based on an ordinance from 1994 and has been updated several times since then, most recently in 2017. The procedure for a new update was initiated at the end of 2019. At the beginning of 2021, there was an opportunity to comment on a first draft of the amending ordinance, and consultation on the second draft of the amending ordinance was carried out at the beginning of 2022. On 30.08.2022, the Cabinet adopted the Amendment Ordinance in accordance with section 4(2) sentence 1 NROG. This entered into force on 17.09.2022 (Nds. GVBl. p. 521).

2.1.3 Schleswig-Holstein

In Schleswig-Holstein, the Land Development Plan (LEP S-H) is the basis for the spatial development of the state. The Ministry of the Interior, Local Government, Housing and Sport of Schleswig-Holstein (MILIG) is responsible for its preparation and amendment. The Land Ordinance on the Land Development Plan - Update 2021 (LEP-VO 2021) came into force on 17.12.2021 after an extensive participation process. The 2021 update relates to the period 2022 to 2036.

2.2 MSFD Programme of Measures

Each EU Member State must develop a marine strategy for its marine waters in order to achieve good status of these waters, in Germany for the North Sea and the Baltic Sea. Essential to this is the establishment of a programme of measures to achieve or maintain good environmental status and the practical implementation of this programme of measures. The establishment of the programme of measures (BMUB, 2016) is regulated in Germany by Section 45h of the Water Resources Act[4] (WHG). Under Objective 2.4 "Seas with sustainably and sparingly used resources", the current MSFD Programme of Measures lists maritime spatial planning as a contribution of existing measures to achieving the operational objectives of the MSFD. The catalogue of measures also formulates a concrete review mandate for the updating of spatial development plans with regard to measures for the protection of migratory species in the marine area. Both the environmental objectives of the MSFD and the MSFD programme of measures are taken into account in the SEA.

2.3 Management plans for nature conservation areas in the EEZ

On 17 November 2017, the Federal Agency for Nature Conservation (BfN) initiated the participation procedure pursuant to Section 7 para. 3 Ordinance on the Establishment of the Nature Conservation Area "Borkum Riffgrund" (NSGBRgV)[5] , Section 7 para. 3 Ordinance on the Establishment of the Nature Conservation Area "Doggerbank" (NSGDgbV)[6] and Section 9 para. 3 Verordnung über die Festsetzung des Naturschutzes "Sylter Außenriff - Östliche Deutsche Bucht" (NSGSylV)[7] on the management plans for nature conservation areas in the German EEZ of the North Sea were initiated. On 13.05.2020, the management plans "Borkum Riffgrund"[8] , "Doggerbank"[9] and "Sylter Außenriff - Östliche Deutsche Bucht"[10] were published in the Federal Gazette.

For the Baltic Sea EEZ, the ordinances on the designation of the nature conservation areas "Fehmarnbelt" (NSGFmbV), "Kadetrinne" (NSGKdrV) and "Pommersche Bucht - Rönnebank" (NSGPBRV) came into force in September 2017. According to the ordinances, the measures necessary to achieve the conservation purposes defined for the nature conservation areas are presented in management plans. These plans were drawn up by the Federal Agency for Nature Conservation in consultation with the neighbouring Länder and the public agencies concerned, as well as with the participation of the interested public and the nature conservation associations recognised by the Federal Government.

On 16 June 2020, the Federal Agency for Nature Conservation (BfN) initiated the participation procedure pursuant to Section 7 (3) NSGFmbV, Section 7 (3) NSGKdrV and Section 11 (3) NSGPBRV for the management plans for the nature conservation areas in the German Baltic Sea EEZ. The management plans for the nature conservation areas "Fehmarnbelt", "Kadetrinne" and "Pommersche Bucht - Rönnebank" were published in the Federal Gazette on 08.02.2022.

[4] Act on the Regulation of Water Resources (Water Resources Act - WHG) of 31 July 2009 (Federal Law Gazette I p. 2585) last amended by Art. 2 G on the Implementation of Requirements of Directive (EU) 2018/2001 for Approval Procedures under the Federal Immission Control Act, the Water Resources Act and the Federal Waterways Act of 18.8.2021 (Federal Law Gazette I p. 3901).

[5] of 22 September 2017 (Federal Law Gazette I p. 3395).

[6] of 22 September 2017 (Federal Law Gazette I p.3400).

[7] of 22 September 2017 (Federal Law Gazette I p. 3423).

[8] published on 17 April 2020, BAnz AT 13.05.2020 B9.

[9] published on 13 May 2020, BAnz AT 13.05.2020 B10.

[10] published on 13 May 2020, BAnz AT 13.05.2020 B11.

In the Delegated Regulation (EU) 2023/340 of the European Commission of 8 December 2022, further fisheries management measures for the nature conservation areas "Borkum Riffgrund" (NSGBRgV), "Doggerbank" (NSGDgbV) and "Sylter Außenriff - Östliche Deutsche Bucht" NSGSylV) are defined in addition to the regulations in the management plans. Staged planning procedure for offshore wind energy and power lines

When considered as a whole, the planning process for the EEZ area is divided into several stages (cf. Figure 1).

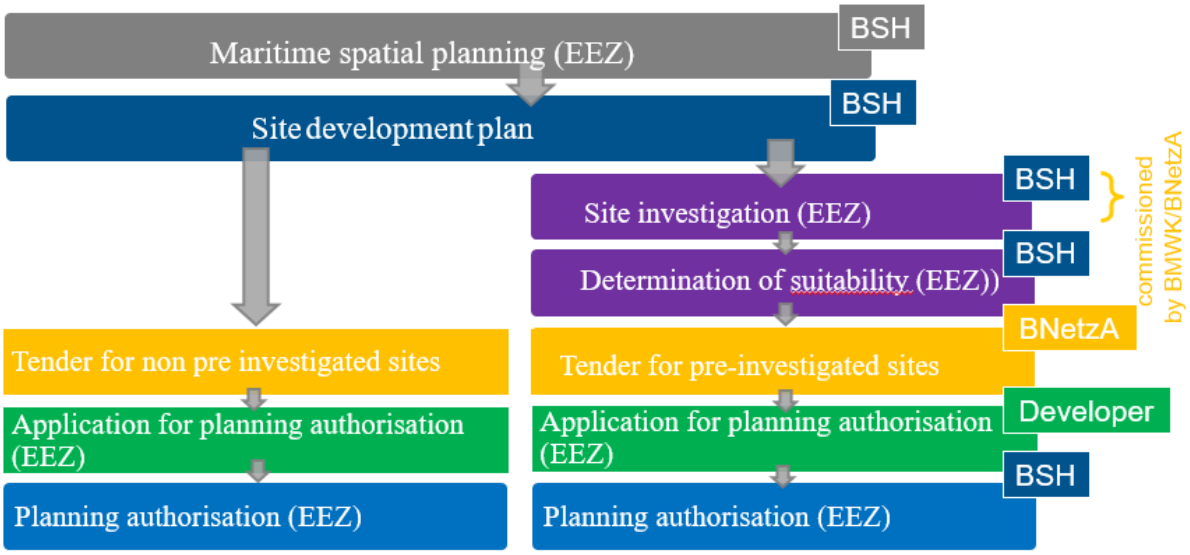

Illustration 1: Staged planning procedure[11]

[11] The schematic representation in Figure 1 is not based on a chronological sequence. The only purpose of the diagram is to provide a schematic representation of the individual process stages.

At the highest and superordinate level is the instrument of maritime spatial planning. The maritime spatial plan for the German EEZ in the North Sea and the Baltic Sea is the long-term, forward-looking planning instrument that coordinates various utilisation interests in the areas of business, science and research as well as protection claims. A Strategic Environmental Assessment (SEA) must be carried out when the maritime spatial plan is drawn up. The SEA for the ROP is related to various downstream environmental assessments, in particular the directly downstream SEA for the FEP.

The next stage is the FEP. In a staged planning process, it is the steering instrument for the orderly expansion of offshore wind energy and power lines. The FEP has the character of a sectoral plan. Among other things, the sectoral plan aims to plan the use of offshore wind energy and power lines in a targeted manner and as optimally as possible under the given framework conditions - taking into account the requirements of regional planning - by defining areas and sites as well as locations, routes and route corridors for grid connections and for interconnectors, and by establishing standardised technology and planning principles. As a matter of principle, an SEA is carried out to accompany the preparation, updating and amendment of the FEP.

In the next step, a central preliminary investigation is carried out for the sites for offshore wind energy that have been identified in the FEP as centrally pre-investigated areas within the meaning of Part 2 Section 2 WindSeeG.

The central preliminary investigation is followed by the determination of the suitability of the site for the construction and operation of offshore wind turbines if the requirements of Section 10 (2) of the WindSea Act are met. The determination of the suitability of an area is also subject to the obligation to carry out an SEA pursuant to Section 12 (2) WindSea Act.

In addition, according to the WindSeeG, sites that have not been centrally pre-investigated must also be put out to tender. The FEP therefore determines whether the tendering of the respective site is to take place within the framework of the central model with preliminary investigation or as an site that has not been centrally pre-investigated.

For the areas that are determined as non-centrally pre-surveyed areas in the FEP, a call for tenders follows in accordance with Part 3 Section 2 WindSeeG. The required investigations on non-centrally pre-surveyed areas will be carried out by the successful bidder.

If the suitability of a site for the use of offshore wind energy is determined during the central preliminary investigation, the site is also put out to tender, then in accordance with Part 3 Section 5 WindSeeG.

Both in the case of tendering after a central preliminary investigation and in the case of tendering of sites that have not been centrally pre-surveyed, the winning bidder or the correspondingly entitled party is granted the right to conduct an approval procedure for the erection and operation of wind turbines on the area specified in the FEP. Within the framework of the planning approval procedure, an environmental impact assessment is carried out according to the current status and if the prerequisites are met.

While the sites defined in the FEP (as centrally or non-centrally pre-screened) for the use of offshore wind energy are tendered, this is not the case for defined sites, routes and route corridors for grid connections or interconnectors. Upon application, a planning approval procedure including environmental assessment is usually carried out for the construction and operation of offshore connection lines. Transit pipelines as well as submarine cables in or on the continental shelf require a permit pursuant to § 133 para. 1 sentence 1 nos. 1, 2 BBergG both in mining terms and with regard to the use and exploitation of the waters above the continental shelf and the airspace above these waters. The latter permission is granted by the BSH pursuant to § 133 para. 1 sentence 2 BBergG.

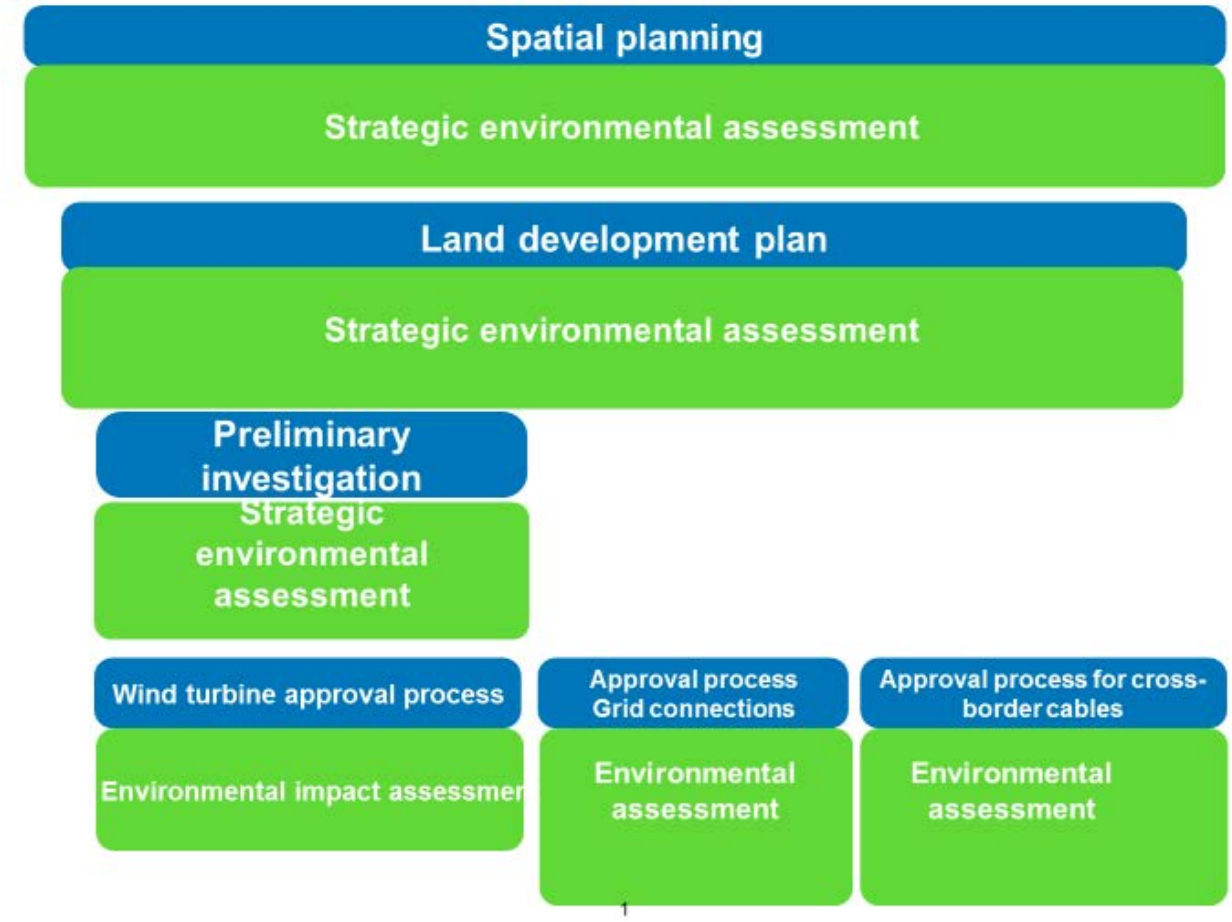

Figure 2 Overview of the staged planning and approval process in the EEZ.[12]

In the case of multi-stage planning and approval processes, it follows for environmental assessments from the respective sectoral legislation (such as the Regional Planning Act (ROG)[13] , WindSeeG and Federal Mining Act (BBergG)[14]) or, by way of generalisation, from § 39 para. 3 sentence 1 UVPG that, in the case of plans and programmes, it should already be determined when defining the scope of the assessment at which of the stages of the process certain environmental impacts are to be assessed in focus. In the case of successive SEAs at the level of the FEP or of suitability assessments, the environmental assessment is also to be limited to additional or other significant environmental impacts and to necessary updates and deepening, pursuant to section 72(1) WindSeeG. In this way, multiple assessments are to be avoided. The type and extent

[12] Reference is made to possible deviations from this procedure due to § 72a WindSeeG and due to the implementation of RED III.

[13] Spatial Planning Act of 22 December 2008 (BGBl. I p. 2986), last amended by Art. 5 G zur Beschleunigung von Investitionen of 3.12.2020 (BGBl. I p. 2694).

[14] Federal Mining Act of 13 August 1980 (BGBl. I p. 1310), last amended by Art. 1 G zur Änd. des BundesbergG und zur Änd. der VwGO of 14.6.2021 (BGBl. I p. 1760).

of the environmental impacts, technical requirements and the content and subject matter of the plan shall be taken into account.

In the case of subsequent plans and in the case of subsequent approvals of projects for which the plan sets a framework, the environmental assessment should or must be limited to additional or other significant environmental impacts as well as to necessary updates and deepening in accordance with Article 39 (3) sentence 3 UVPG and Article 72 (1) WindSeeG. Reference is made to possible deviations from this procedure due to § 72a WindSeeG and due to the implementation of RED III.

Within the framework of the staged planning and approval process, all assessments have in common that environmental impacts on the protected interests listed in Article 2 (1) UVPG, including their interactions, are considered.

According to the definition in Article 2 (2) UVPG, environmental effects within the meaning of the UVPG are direct and indirect effects of a project or the implementation of a plan or programme on the objects of protection.

According to § 3 UVPG, environmental assessments comprise the identification, description and evaluation of the significant effects of a project or a plan or programme on the objects of protection. They serve to ensure effective environmental precautions in accordance with the applicable laws and are carried out according to uniform principles and with public participation.

In the offshore area, the special conservation areas of avifauna (seabirds and resting birds as well as migratory birds), benthos, biotope types, plankton, marine mammals, fish and bats have established themselves as sub-categories of the legally named conservation areas of animals, plants and biological diversity.

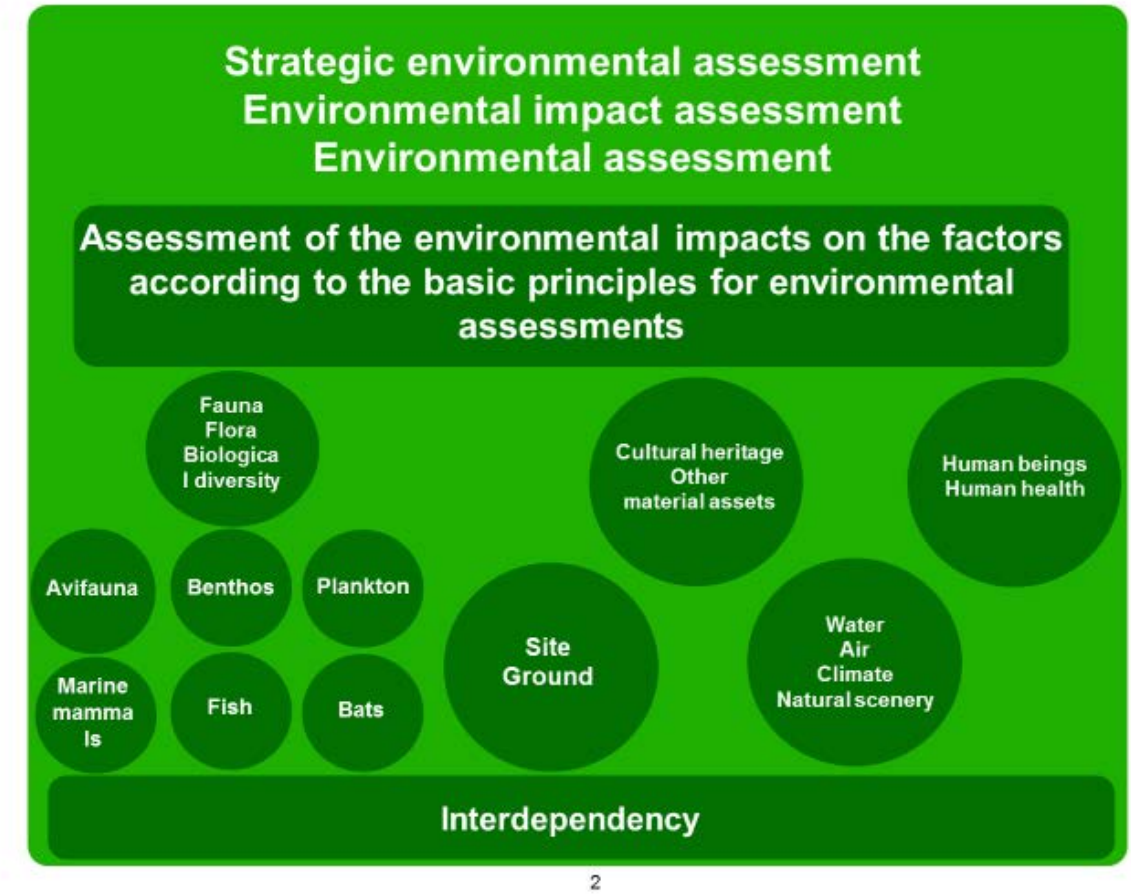

Figure 3Overview of the objects of protection in the environmental assessments .

In detail, the staged planning process is as follows:

2.3.1 Maritime Spatial Planning (EEZ)

At the highest and superordinate level is the instrument of maritime spatial planning. For sustainable spatial development in the EEZ, the BSH prepares a martime spatial plan on behalf of the responsible federal ministry, which comes into force in the form of legal ordinances. The ROP for the German EEZ in the North Sea and the Baltic Sea came into force on 1 September 2021.

The maritime spatial plans shall, taking into account any interactions between land and sea as well as safety aspects, determine

- to ensure the safety and ease of shipping traffic,
- to other economic uses,
- on scientific uses and
- to protect and enhance the marine environment.

Within the framework of spatial planning, specifications are predominantly made in the form of priority and reserved areas as well as other objectives and principles. Pursuant to Section 8 (1) ROG, a strategic environmental assessment must be carried out by the body responsible for the spatial development plan when drawing up spatial development plans, in which the likely significant effects of the respective spatial development plan on the protected assets, including interactions, are to be identified, described and assessed.

The aim of the spatial planning instrument is to optimise overall planning solutions. A wider spectrum of uses and functions is considered. At the beginning of a planning process, strategic fundamental questions are to be clarified. Thus the instrument functions primarily and within the framework of the legal provisions as a steering planning instrument of the planning administrative bodies in order to create a spatially and as far as possible environmentally compatible framework for all uses.

The **depth of assessment in** SEA for spatial planning is fundamentally characterised by a greater breadth of investigation, i.e. a fundamentally greater number of planning options, and a lesser depth of investigation in terms of detailed analyses. Above all, regional, national and global impacts as well as secondary, cumulative and synergetic impacts are taken into account.

The **focus is** therefore on possible cumulative effects, strategic and large-scale planning options and possible transboundary impacts.

2.3.2 Site development plan

At the next level is the FEP.

The specifications to be made by the FEP and to be examined within the framework of the SEA are derived from § 5 para. 1 WindSeeG. The plan mainly specifies areas and sites for wind turbines, the expected power to be installed on the sites and whether the site is to be pre-surveyed centrally or not. In addition, the FEP specifies routes, route corridors, locations and other energy generation areas. Furthermore, planning and technical principles are laid down. Among other things, these also serve to reduce environmental impacts, but can in turn also lead to impacts, so that an assessment is required as part of the SEA.

In addition, the FEP specifies timeframes, such as the chronological order in which the sites for offshore wind energy are to be put out to tender and the calendar years for commissioning. These are not a focus of the SEA, but are becoming increasingly important for the assessment of environmental impacts in view of the current range of sites.

The specifications of the FEP must be permissible in accordance with the requirements of § 5 WindSeeG. Pursuant to § 5 para. 3 sentence 2 no. 2 WindSeeG, designations are not permissible in particular if they conflict with overriding public or private interests.

This assessment is related to nature conservation law insofar as, in particular, designations are impermissible if they endanger the marine

environment or if the area, the site or the other energy production area is not compatible with the protective purpose of a protected area ordinance issued pursuant to section 57 of the Federal Nature Conservation Act; in this context, designations are permissible if, pursuant to section 34(2) of the Federal Nature Conservation Act, they cannot lead to significant impairments of the components of the area relevant to the protective purpose of the respective protected area ordinance or if they meet the requirements pursuant to section 34(3) to (5) of the Federal Nature Conservation Act.

P. 2 According to Section 40 (1) p. 2 UVPG, the environmental report shall identify, describe and assess the likely significant environmental effects of the implementation of the plan as well as reasonable alternatives. Pursuant to Section 40 (3) UVPG, the competent authority shall provisionally assess the environmental effects of the plan on the objects of protection in the environmental report in accordance with the principles of environmental assessment. The assessment standards of the sectoral legislation and the UVPG are essentially congruent, as the assessment of the environmental effects in the environmental assessments is carried out in accordance with the applicable legislation.

With regard to the **objectives of** the FEP, it deals with the fundamental questions of the use of offshore wind energy and grid connections on the basis of the legal requirements, especially with regard to the need, purpose, technology and the identification of sites and routes or route corridors. The plan therefore primarily has the function of a steering planning instrument to create a spatially and, as far as possible, environmentally compatible framework for the realisation of individual projects, i.e. the construction and operation of offshore wind turbines, their grid connections, other energy generation areas, interconnectors and connections between them.

The **depth of** the **assessment of** likely significant environmental impacts is characterised by a greater breadth of investigation, i.e. a greater number of alternatives and, in principle, a lesser depth of investigation. As a rule, no detailed analyses are carried out at the level of sectoral planning. Above all, local, national and global impacts as well as secondary, cumulative and synergetic impacts are taken into account in the sense of an overall assessment.

As with the instrument of maritime spatial planning, the **focus of the** assessment is on possible cumulative effects as well as possible transboundary impacts. Against this background, impacts on mobile protected goods such as marine mammals, seabirds and resting birds, migratory birds and bats are of particular interest. The area as a protected resource is also examined primarily at the level of the area development plan.

Against this background, assessments are not to be repeated in the environmental report to be prepared for the FEP update; instead, pursuant to Section 39 para. 3 sentence 3 UVPG, the environmental assessment is to be limited to additional or other significant environmental impacts as well as to necessary updates and deepening. If an SEA has already been carried out in the context of the FEP or ROP, a corresponding stratification is obligatory under Article 72(1) of the WindSeeG. In-depth analyses are carried out for wind energy and (electricity-) transmission lines, for example with regard to strategic, technical and spatial alternatives.

2.3.3 Suitability assessment as part of the central preliminary investigation

Insofar as the site is defined in the FEP as a central preliminary investigation site, the next step in the staged planning process is to examine the suitability of sites for the construction and operation of offshore wind turbines. In addition, the power to be installed on the site in question is determined. This stage of the environmental assessment does not apply to sites that have not been centrally pre-surveyed.

In the case of centrally pre-screened areas, the suitability test pursuant to Article 10(2) of the WindSeeG shall examine whether the erection and operation of offshore wind turbines on the site meet the criteria for the inadmissibility of the designation of a site in the site development plan pursuant to Article 5(3) of the WindSeeG or, insofar as they can be assessed independently of the subsequent design of the project, the relevant concerns for plan approval pursuant to Article 69(3) sentence 1 of the WindSeeG.

Both the criteria of § 5 para. 3 WindSeeG and the concerns of § 69 para. 3 sentence 1 WindSeeG require an assessment of whether the marine environment is endangered. With regard to the latter concerns, it must be checked in particular whether there is no concern of pollution of the marine environment within the meaning of Article 1 para. 1 no. 4 of the United Nations Convention on the Law of the Sea (UNCLOS) and whether there is no proven significantly increased risk of collision of birds with wind turbines that cannot be mitigated by protective measures. The central preliminary investigation with the suitability assessment and the suitability determination is thus currently an instrument between the FEP and the individual approval procedure for offshore wind turbines. It relates to a specific site designated in the FEP and is thus much more detailed than the FEP. It is distinguished from the respective approval procedure by the fact that a test approach is to be applied that is independent of the subsequent concrete turbine type and layout. The impact forecast is based on model parameters, for example in scenarios or ranges, which are intended to reflect possible realistic developments.

Compared to the FEP, the SEA of the suitability assessment is thus characterised by a smaller investigation site and a greater depth of investigation. In principle, fewer alternatives and alternatives that are spatially limited to the site are seriously considered.

In the context of the suitability assessment, the focus of the environmental assessment is on the consideration of the local impacts of a development with wind turbines in relation to the area and the location of the development on the area. Therefore, the protected goods soil and benthos in particular not only need to be updated compared to the SEA comments on the ROP, but also considered again at the small-scale level.

As part of the preliminary site investigation, which forms the basis of the suitability assessment, data is collected and evaluated in the German EEZ in the multi-stage planning process. Since this offshore data is available for the first time at the level of the suitability assessment for the areas to be pre-investigated, updating the environmental impacts assessed at previous levels is also of great importance here. If new findings are available, the assessments of the mobile protected goods (marine mammals and avifauna) in particular must be updated and supplemented. If cultural monuments or protected biotopes are found or more precisely located, the environmental assessments of the preceding levels (ROP, FEP) must also be supplemented accordingly with regard to these environmental aspects when updates or amendments are made.

2.3.4 Approval procedures (planning approval and planning permission procedures) for offshore wind turbines and other energy generation areas

The next stage after the preliminary investigation is the approval procedure for the construction and operation of offshore wind turbines. After the pre-investigation site has been put out to tender by the BNetzA, the winning bidder can submit an application for planning approval or - if the requirements are met - for planning permission for the construction and operation of offshore wind turbines, including the necessary ancillary facilities, on the pre-investigated area to the BNetzA in accordance with section 67 (1) of the WindSeeG.

In addition to the legal requirements of § 73 para. 1 sentence 2 VwVfG, the plan must include the information contained in § 68 para. 1 WindSeeG. The plan may only be adopted under certain conditions listed in § 69 para. 3 WindSeeG and, inter alia, only if the marine environment is not endangered, in particular if there is no concern of pollution of the marine environment within the meaning of Article 1 para. 1 no. 4 UNCLOS and if there is no proven significantly increased risk of collision of birds with wind turbines which cannot be mitigated by protective measures.

Pursuant to § 24 UVPG, the competent authority shall prepare a summary presentation

- the environmental impact of the project,
- the characteristics of the project and the site that are intended to exclude, mitigate or compensate for significant adverse environmental effects,
- the measures to exclude, reduce or compensate for significant adverse environmental effects, and
- of compensatory measures in the case of interventions in nature and landscape.

Pursuant to Article 16 (1) UVPG , the developer shall submit a report to the competent authority on the likely environmental effects of the project (EIA report), which shall contain at least the following information:

- A description of the project including the location, nature, scope and design, size and other essential characteristics of the project,
- a description of the environment and its components in the area affected by the project,
- a description of the characteristics of the project and the site which are intended to exclude, mitigate or compensate for the occurrence of significant adverse environmental effects of the project,
- a description of the planned measures to exclude, reduce or compensate for the occurrence of significant adverse environmental effects of the project and a description of planned compensatory measures,
- a description of the expected significant environmental effects of the project,
- A description of the reasonable alternatives relevant to the project and its specific characteristics that have been considered by the developer and an indication of the main reasons for the choice made, taking into account the environmental effects of each; and
- a generally understandable, non-technical summary of the EIA report.

In addition, an emission concept must be submitted with the planning documents.

At the approval level, the focus is on project-relevant material emissions and their impact on the marine environment. In addition, supplements are always to be made at this level if new assessments are required on the basis of the concrete planning of the wind farm project with knowledge of the respective project parameters, or if new findings make updates or more in-depth assessments necessary.

For offshore wind farms on non-pre-surveyed areas, a comprehensive environmental impact assessment is carried out within the framework of a planning approval procedure according to the current status. In contrast to pre-surveyed sites, the developer has to carry out its own environmental studies of the marine environment (baseline survey according to the StUK) as a basis for the EIA.

Pilot wind turbines and projects intended for the further development of technology are also not dealt with at upstream stages, as a realistic assessment of the environmental impacts is not possible. For them, therefore, a comprehensive assessment within the framework of a licensing procedure is also necessary.

For other energy generation areas, there are also no studies from previous levels, so that here too a comprehensive environmental impact assessment is carried out within the framework of a planning approval procedure.

2.3.5 Approval procedure for grid connections (converter platforms and submarine cable systems)

In the staged planning process, the construction and operation of grid connections for offshore wind turbines (converter platform and submarine cable systems, if applicable) is examined at the level of approval procedures (plan approval and plan authorisation procedures) in implementation of the requirements of regional planning and the specifications of the FEP at the request of the respective developer - the responsible TSO.

Pursuant to § 65 para. 1 in conjunction with 66 para. 2 WindSeeG, the construction and operation of connection lines require planning approval. In addition to the legal requirements of § 73 para. 1 sentence 2 VwVfG, the plan must include the information contained in § 68 para. 1 WindSeeG. The plan may only be adopted or the plan approval granted under certain conditions listed in § 69 para. 3 WindSeeG. These include that the marine environment must not be endangered, in particular that there is no concern of pollution of the marine environment within the meaning of Article 1 para 1 no. 4 UNCLOS and that there is no proven significantly increased risk of collision of birds with wind turbines which cannot be reduced by protective measures.

In all other respects, the requirements for the environmental impact assessment of offshore wind turbines, including ancillary installations, shall apply mutatis mutandis to the environmental assessment pursuant to Article 1(4) UVPG.

2.3.6 Interconnectors

Pursuant to Section 133 (1) in conjunction with Section 133 (4) BBergG. (4) BBergG, the construction and operation of a grid connection in or on the continental shelf requires a permit.

- in mining terms (by the competent state mining office) and
- with regard to the ordering of the use and enjoyment of the waters above the continental shelf and of the airspace above these waters (by the BSH).

Pursuant to Section 133 (2) BBergG, the above-mentioned permits may only be refused if there is a risk to the life or health of persons or to material goods or an impairment of overriding public interests which cannot be prevented or compensated for by a time limit, by conditions or obligations. An impairment of overriding public interests exists in particular in the cases mentioned in section 132 (2) no. 3 BBergG. Pursuant to Section 132 (2) No. 3 (b) and (d) BBergG, an impairment of overriding public interests with regard to the marine environment exists in particular if the flora and fauna would be unacceptably impaired or if there is a risk of pollution of the sea.

For the construction and operation of interconnectors, the essential requirements of the UVPG according to § 1 para. 4 UVPG must be observed.

2.3.7 Summary overviews of the environmental assessments

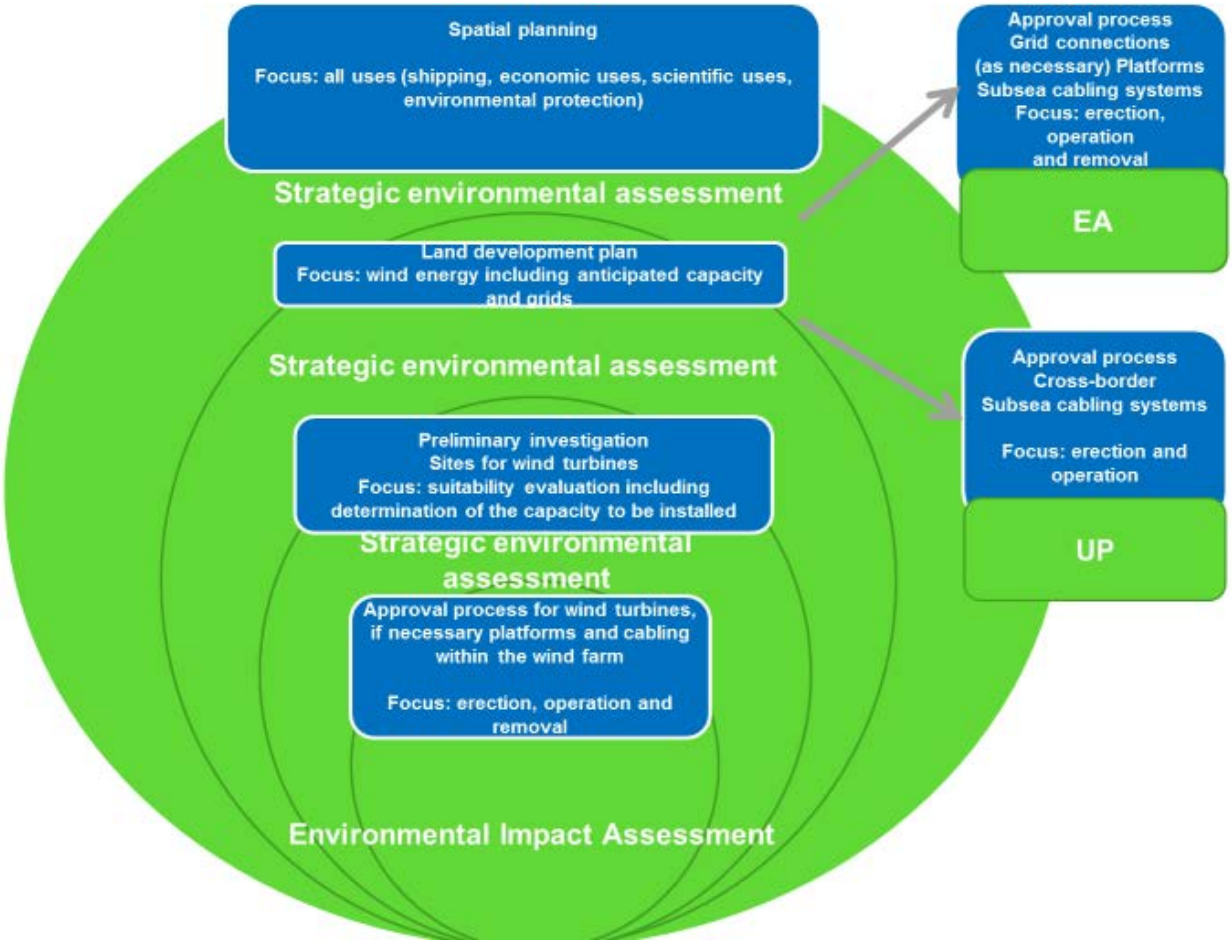

Figure 4: Environmental assessments in the staged planning and approval process with the focus of the respective assessment .[15]

[15] Reference is made to possible deviations from this procedure due to § 72a WindSeeG and due to the implementation of RED III.

3 Presentation and consideration of the goals of environmental protection

The preparation and updating of the FEP as well as the implementation of the SEA are carried out taking into account the environmental protection objectives. These provide information on the environmental status to be aimed for in the future (environmental quality objectives). The environmental protection objectives can be derived from an overall view of the international, EU and national conventions and regulations that deal with marine environmental protection and on the basis of which the Federal Republic of Germany has committed itself to certain principles and objectives. The environmental reports on the ROP 2021 contain a description of how compliance with the aforementioned relevant international, EU and national regulations and recommendations is examined and implemented and what stipulations or measures are taken. If there is a need for updates or changes in the context of the update of the RDP, a supplementary presentation will be made in the forthcoming environmental report.

3.1 International conventions on marine environmental protection

The Federal Republic of Germany is a party to all relevant international conventions on marine environmental protection.

3.1.1 Globally applicable conventions that directly or indirectly serve the protection of the marine environment

- Convention for the Prevention of Pollution from Ships, 1973, as amended by the Protocol of 1978 (MARPOL 73/78).
- 1982 United Nations Convention on the Law of the Sea (UNCLOS)
- Convention on the Prevention of Marine Pollution by Dumping of Wastes and Other Matter of 29 December 1972 (London Convention) and the 1996 Protocol (London Protocol).
- Convention on Biological Diversity 1992 (Biodiversity Convention)
- Stockholm Convention on Persistent Organic Pollutants (POP Convention) 2004

3.1.2 Regional agreements on marine environmental protection

- Trilateral Wadden Sea Cooperation (1978) and Trilateral Monitoring and Assessment Programme of 1997 (TMAP)
- Convention for Co-operation between North Sea States in Combating Pollution of the North Sea by Oil and Other Harmful Substances, 1983 (Bonn Convention)
- Convention for the Protection of the Marine Environment of the North-East Atlantic, 1992 (OSPAR Convention)
- Convention on the Protection of the Marine Environment of the Baltic Sea Area 1992 (Helsinki Convention)

3.1.3 Agreements specific to protected goods

- Convention on the Conservation of European Wildlife and Natural Habitats of 1979 (Bern Convention)
- Convention on the Conservation of Migratory Species of Wild Animals 1979 (Bonn Convention)

Within the framework of the Bonn Convention, regional agreements on the conservation of the species listed in Appendix II were concluded in accordance with Art. 4 No. 3 Bonn Convention:

- Agreement on the Conservation of African-Eurasian Migratory Waterbirds 1995 (AEWA)

- Agreement on the Conservation of Small Cetaceans of the North Sea and Baltic Sea of 1991 (ASCOBANS)
- Agreement on the Conservation of Seals in the Wadden Sea of 1991
- Agreement on the Conservation of European Bat Populations of 1991 (EUROBATS)

3.2 Global climate protection agreements

- Framework Convention on Climate Change of 1992 (UNFCCC) and Kyoto Protocol of 1997
- Paris Agreement of 2015

3.3 Environmental and nature conservation requirements at EU level

The relevant EU legislation to be taken into account is:

- Council Directive 337/85/EEC of 27 June 1985 on the assessment of the effects of certain public and private projects on the environment (Environmental Impact Assessment Directive, EIA Directive),
- Council Directive 92/43/EEC of 21 May 1992 on the conservation of natural habitats and of wild fauna and flora (Habitats Directive),
- Directive 2000/60/EC of the European Parliament and of the Council of 23 October 2000 establishing a framework for Community action in the field of water policy (Water Framework Directive, WFD),
- Directive 2001/42/EC of the European Parliament and of the Council of 27 June 2001 on the assessment of the effects of certain plans and programmes on the environment (Strategic Environmental Assessment Directive, SEA Directive),
- Directive 2008/56/EC of the European Parliament and of the Council of 17 June 2008 establishing a Framework for Community Action in the field of Marine Environmental Policy (Marine Strategy Framework Directive, MSFD),
- Directive 2009/147/EC of the European Parliament and of the Council on the conservation of wild birds (Birds Directive, Birds Directive).
- Rules on sustainable fisheries under the EU Common Fisheries Policy, including Regulations 2013/1380/EU and 2013/1379/EU.
- Regulation (EU) 517/2014 of the European Parliament and of the Council of 16 April 2014 on fluorinated greenhouse gases and repealing Regulation (EC) No 842/2006 Regulation (EC) No 1907/2006 of the European Parliament and of the Council of 18 December 2006 concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH). December 2006 concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH), establishing a European Chemicals Agency, amending Directive 1999/45/EC and repealing Council Regulation (EEC) No 793/93 and Commission Regulation (EC) No 1488/94 as well as Council Directive 76/769/EEC and Commission Directives 91/155/EEC, 93/67/EEC, 93/105/EC and 2000/21/EC.
- Regulation (EU) 2019/1021 of the European Parliament and of the Council of 20 June 2019 on persistent organic pollutants.

3.4 Environmental and nature conservation requirements at national level

There are also various legal requirements at the national level that must be taken into account in the environmental report:

- Nature Conservation and Landscape Management Act (Bundesnaturschutzgesetz - BNatSchG)
- Water Resources Act (WHG)
- Environmental Impact Assessment Act (UVPG)
- Act on the Development and Promotion of Wind Energy at Sea (Wind Energy at Sea Act - WindSeeG)
- Ordinance on the Establishment of the Nature Reserve "Sylt Outer Reef - Eastern German Bight", the Ordinance on the Establishment of the Nature Reserve "Borkum Riffgrund", and the Ordinance on the Establishment of the Nature Reserve "Dogger Bank" in the North Sea EEZ
- Ordinance on the Establishment of the "Fehmarn Belt" Nature Reserve, the Ordinance on the Establishment of the "Kadet Trench" Nature Reserve and the Ordinance on the Establishment of the "Eastern German Bight - Rönnebank" Nature Reserve in the Baltic Sea EEZ
- Management plans for nature conservation areas in the German EEZ of the North Sea
- Management plans for nature conservation areas in the German Baltic Sea EEZ
- Energy and climate protection targets of the Federal Government
- Law on the International Convention for the Control and Management of Ships' Ballast Water and Sediments, 2004 (Ballast Water Act) of 5 February 2013
- Concept for the protection of harbour porpoises from noise pollution during the construction of offshore wind farms in the German North Sea (Noise Protection Concept, BMU 2013)
- Priority area for loons pursuant to 2.4 (1) of the Annex to the Ordinance on Spatial Planning in the German Exclusive Economic Zone in the North Sea and the Baltic Sea of 19 August 2021, Federal Law Gazette I p. 3886.

Figure 5Overview of the normative levels of the relevant legal acts for SEA.

4 Methodology of the Strategic Environmental Assessment

In principle, various methodological approaches can be considered when carrying out the strategic environmental assessment. This environmental report builds on the methodology already used for the strategic environmental assessment of the sectoral federal plans and the site development plan, which was also used for the strategic environmental assessment of the ROP with regard to offshore wind energy and transmission lines.

The methodology depends primarily on the provisions of the plan to be assessed. Within the framework of this SEA, it is determined, described and assessed for the individual specifications whether the specifications are likely to have significant effects on the objects of protection concerned. According to Section 1 (4) UVPG in conjunction with Section 40 (3) UVPG. § Section 40 (3) UVPG, the competent authority shall provisionally assess the environmental effects of the specifications in the environmental report with regard to effective environmental precaution in accordance with the applicable legislation. According to the special legal standard of § 5 para. 3 WindSeeG, the specifications must not lead to a hazard to the marine environment. In this context, the requirements of nature conservation law (especially the Federal Nature Conservation Act) must also be examined.

The subject matter of the environmental report comprises the description and assessment of the likely significant effects of the implementation of the FEP on the marine environment for the determinations of the FEP as listed in § 5 para. 1 WindSeeG (see 1.3).

However, the temporal specifications, such as the order of tendering or calendar years of commissioning, are less important here, as these do not lead to any further environmental impacts compared to the spatial specifications. Although some planning and technical principles also serve to reduce environmental impacts, they can also lead to impacts, so that an assessment is necessary.

The following specifications are examined in **relation to** their likely significant environmental impacts**:**

- Areas and sites for offshore wind energy, including the determination of the expected capacity to be installed.
- Grid connections and corridors, including border corridors
- Locations for platforms (converter and collection platforms and substations)
- Designation of other energy production areas
- Relevant planning and technical principles

4.1 Study area

The description and assessment of the environmental status relates to the EEZs of the North Sea and the Baltic Sea, for which the FEP essentially makes specifications. The SEA study area covers the German EEZ of the North Sea (Figure 6) and the Baltic Sea (Figure 7). It should be noted that the data situation within the EEZ of the North Sea is significantly better for the site up to the shipping route SN10 than for the area northwest of the shipping route SN10 due to the available project-related monitoring data.

For the area northwest of shipping route 10, the FEP preliminary draft makes statements on areas, possible expansion areas and border corridors for interconnectors. Based on the available sediment data and findings from the Biodiversity Monitoring of the BfN, an initial descrip-

tion and assessment of the environmental status and a rough evaluation of the potential environmental impacts is possible for this area.

The adjacent territorial sea and the adjacent areas of the riparian states are not directly the subject of this plan, but they are considered as part of the cumulative and transboundary consideration of this SEA, where necessary.

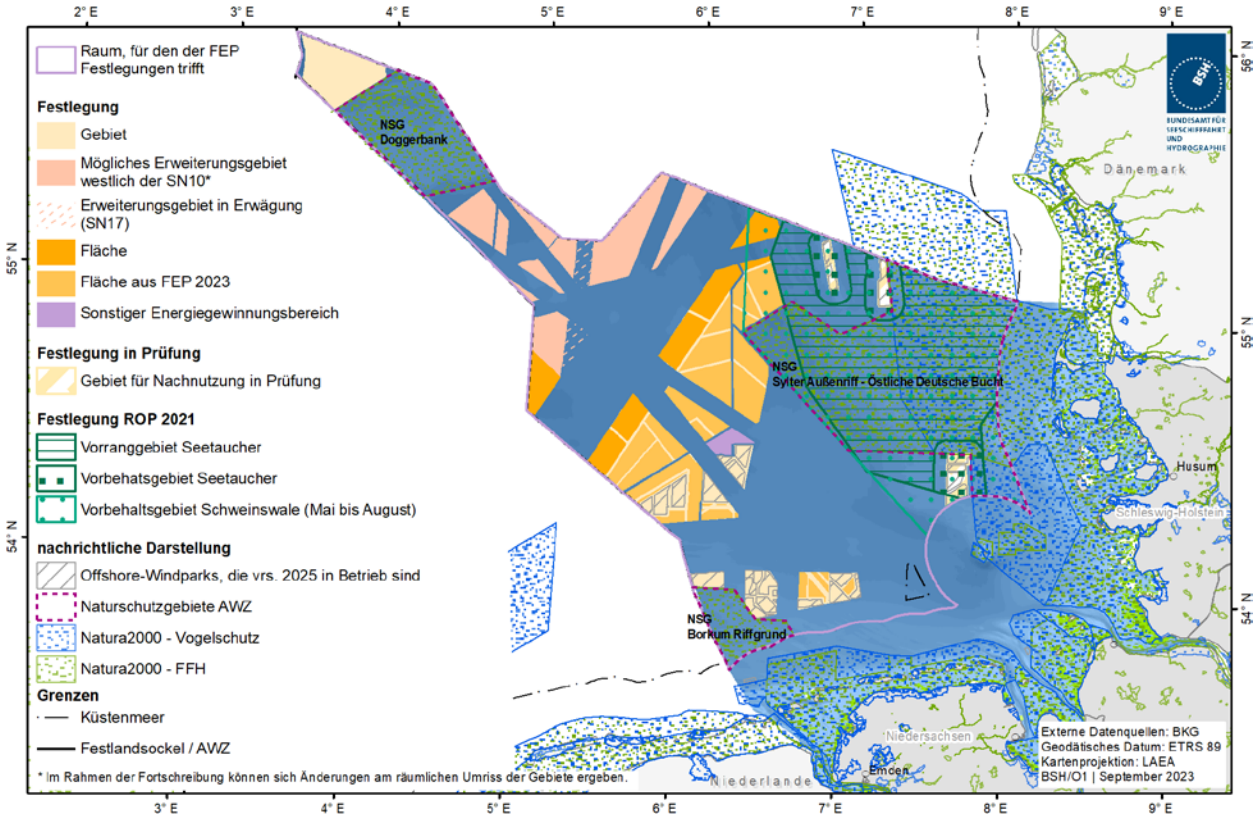

Illustration 6Delimitation of the study area for the SEA of the land development plan, in this case the North Sea EEZ.

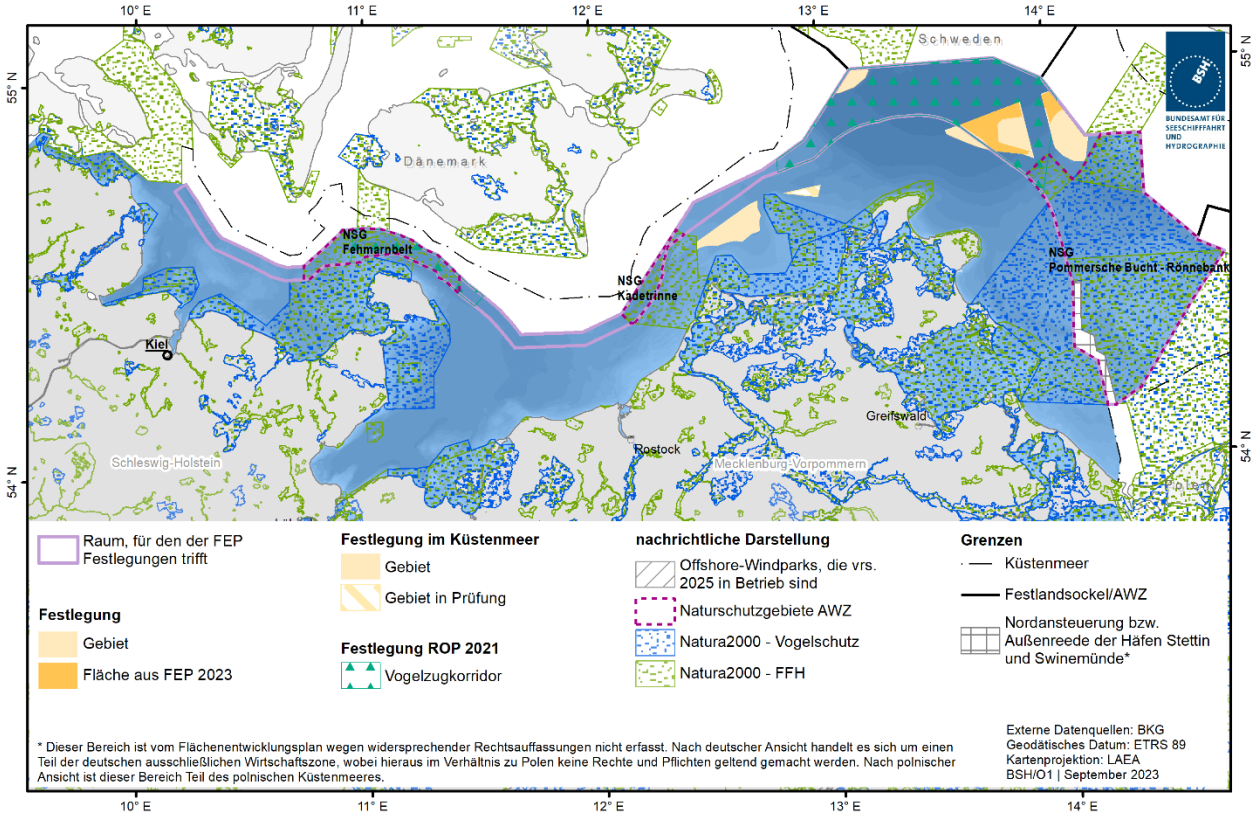

Figure 7Delimitation of the study area for the SEA of the land development plan, here Baltic Sea EEZ.

4.2 Implementation of the environmental assessment

As with the SEA on maritime spatial planning, the assessment of the likely significant environmental effects of the implementation of the FEP includes secondary, cumulative, synergistic, short-, medium- and long-term, permanent and temporary, positive and negative effects in terms of protected goods. Secondary or indirect effects are those that do not take effect immediately and thus possibly only after some time and/or at other locations. Occasionally, we also speak of consequential effects or interactions.

Possible impacts of plan implementation are described and assessed in relation to the protected goods. A uniform definition of the term "significance" does not exist, as it is a matter of "individually determined significance in each case", which cannot be considered independently of the "specific characteristics of plans or programmes" (SOMMER, 2005, 25f.). In general, significant impacts can be understood as those effects that are severe and significant in the context under consideration.

According to the criteria of Annex 6 of the UVPG, which are relevant for the assessment of the likely significant environmental impacts, the significance is determined by

- "the likelihood, duration, frequency and irreversibility of the effects;
- the cumulative nature of the effects;
- the transboundary nature of the impacts;
- the risks to human health or the environment (e.g. in the event of accidents);
- the scale and spatial extent of the impact;
- the importance and sensitivity of the area likely to be affected due to its special natural features or cultural heritage, exceedance of environmental quality standards or limit values, and intensive land use;

- the impact on sites or landscapes whose status is recognised as nationally, community or internationally protected".

Furthermore, the characteristics of the plan are also relevant, in particular with regard to

- the extent to which the plan sets a framework for projects and other activities in terms of location, type, size and operating conditions, or through the use of resources;
- The extent to which the plan influences other plans and programmes, including those in a planning hierarchy;
- the importance of the Plan in integrating environmental considerations, particularly with a view to promoting sustainable development;
- the environmental issues relevant to the plan;
- the relevance of the plan for the implementation of Community environmental legislation (e.g. plans and programmes concerning waste management or water protection) (Annex II SEA Directive).

In some cases, further specifications on when an impact reaches the materiality threshold result from sectoral legislation. Thresholds have been developed in sub-legislation in order to be able to make a distinction.

According to the requirements of § 5 para. 3 p. 5 WindSeeG in conjunction with § 39 para. 3 p. 3 UVPG. § Section 39 (3) sentence 3 UVPG, it is first examined whether there are additional or other significant environmental impacts compared to the ROP and the SEA carried out in this procedure and whether updates and deepening are required. It is also examined whether there is a need for adaptation and amendment compared to the SEA of the existing FEP, which, according to Section 72 (1) WindSeeG, means that the SEA may only be limited to additional or other significant environmental effects and to necessary updates and deepening. Assessments for which no changes have arisen are not repeated; reference is made to the respective results in the existing environmental reports in this respect. For these two reasons, the scope of the assessment is therefore limited to additional or different significant environmental impacts as well as to necessary updates and deepening. This assessment will be carried out separately for areas and surfaces, platforms, submarine cable systems and other energy generation areas, taking into account the assessment of the protected goods. Furthermore, if necessary, a differentiation will be made according to different technical designs. All plan contents that can potentially have significant environmental impacts are examined.

In this context, both the construction- and dismantling-related impacts as well as the plant- and operation-related impacts are considered. In addition, impacts that may arise in the course of maintenance and repair work are taken into account. Possible interactions, cumulative effects and transboundary impacts are also considered.

The result of the assessment as to whether additional or other significant environmental impacts arise and whether updates and deepening are required is documented in the environmental report in each case. Any assessments, updates or deepening required beyond the SEA for the existing FEP or the SEA for the ROP will be carried out as part of the upcoming

SEA for the FEP and described in the environmental report.

The following protected interests are considered:

- Area
- Areal Use
- Water
- Plankton
- Biotope types
- Benthos
- Fish
- Marine mammals
- Avifauna (seabirds and resting birds, migratory birds)
- Bats
- Biodiversity
- Air
- Climate
- Landscape
- Tangible assets, cultural heritage
- People, especially human health
- Interactions between protected goods

In general, the following methodological approaches find their way into the environmental assessment:

- Qualitative descriptions and assessments
- Quantitative descriptions and evaluations
- Evaluation of studies and specialist literature, expert opinions
- Visualisations
- Worst-case assumptions
- Trend assessments (e.g. on the state of the art of installations)
- Assessments by experts/ the professional public

In general, the assessment of the impacts of the FEP specifications continues to be based on the description and assessment of the status and the function and significance of the individual areas, sites, other energy production areas, platform sites and routes for the individual objects of protection on the one hand, and the effects and resulting potential impacts of these specifications on the other. A forecast of the project-related impacts in the event of implementation of the FEP is made depending on the criteria of intensity, range and duration or frequency of the effects (cf. Figure 8).

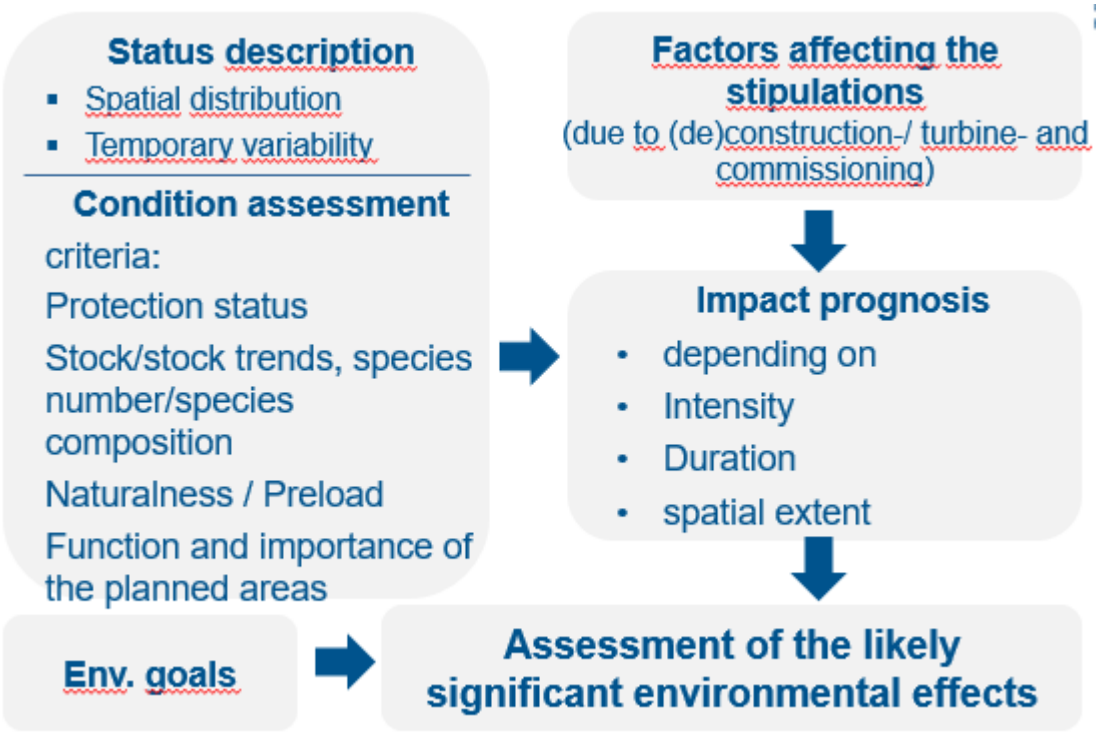

Illustration 8: General methodology of the assessment of likely significant environmental effects.

4.3 Criteria for condition description and condition assessment

The assessment of the status of the individual protected assets is carried out on the basis of various criteria. For the protected assets surface/soil, benthos and fish, the assessment is based on the aspects of rarity and endangerment, diversity and specificity, and existing pressures. The description and assessment of marine mammals, seabirds and resting birds is based on the aspects listed in the figure. As these are highly mobile species, an approach analogous to that for the protected goods surface/soil, benthos, biotope types and fish is not expedient. For seabirds and resting birds and marine mammals, the criteria of protection status, assessment of occurrence, assessment of spatial units and existing pressures are used as a basis. For migratory birds, in addition to rarity and endangerment and existing pressures, the aspects of assessment of occurrence and large-scale importance of the area for bird migration are considered. For bats, there is currently no reliable data available for a criteria-based assessment. The biodiversity site is assessed textually.

The following is a list of the criteria used to assess the status of the respective protected assets. This overview deals with the protected assets that can be meaningfully delimited on the basis of criteria and are considered in the focus.

Surface/Areal Use

Aspect: Rarity and endangerment
Criterion: areal proportion of sediments on the seabed and distribution of the morphological form inventory.
Aspect: Diversity and Eigenart
Criterion: Heterogeneity of the sediments on the seabed and formation of the morphological form inventory.
Aspect: Previous impacts
Criterion: Extent of anthropogenic previous impacts of seabed sediments and morphological form inventory.

Benthos

Aspect: Rarity and endangerment
Criterion: Number of rare or endangered species based on the detected Red List species (Red List of (Rachor et al. 2013).
Aspect: Diversity and Eigenart
Criterion: Number of species and composition of species communities. The extent to which species or communities characteristic of the habitat occur and how regularly they occur is assessed.
Aspect: Preload
For this criterion, the intensity of fishing use, which represents the most effective disturbance variable, is used as an assessment criterion. Furthermore, benthic communities can be impaired by eutrophication. For other disturbance variables, such as shipping traffic, pollutants, etc., suitable measurement and detection methods are still lacking in order to be able to include them in the assessment.

Biotope types

Aspect: Rarity and endangerment
Criterion: national protection status as well as endangerment of the biotope types according to the Red List of Endangered Biotope Types of Germany (Finck et al. 2017).
Aspect: Preload
Criterion: Endangerment by anthropogenic influences.

Fish

Aspect: Rarity and endangerment
Criterion: Proportion of species that are considered endangered according to the current Red List of marine fishes (Thiel et al. 2013) and for the diadromous species of the Red List of freshwater fishes (Freyhof 2009) and have been assigned to Red List categories.
Aspect: Diversity and Eigenart
Criterion: The diversity of a fish community can be described by the number of species (α-diversity, 'species richness'). Species composition can be used to assess the distinctiveness of a fish community, i.e. how regularly habitat-typical species occur. Diversity and species richness are compared and assessed between the entire North Sea or Baltic Sea and the German EEZ, as well as between the EEZ and the individual areas where the FEP makes specifications.
Aspect: Preload
Criterion: Due to the removal of target species and bycatch, as well as the impact on the seabed in the case of bottom-disturbing fishing methods, fishing is considered to be the most effective disturbance of the fish community and therefore serves as a measure of the pre-existing pressure on fish communities in the North Sea or Baltic Sea. An assessment of stocks at a smaller spatial scale, such as the German Bight, is not carried out. The input of nutrients into natural waters is another pathway through which human activities can influence fish communities. Therefore, eutrophication is used for the pre-stress assessment.

Marine mammals

Aspect: Protection status
Criterion: Status according to Annex II and Annex IV of the Habitats Directive and the following international conservation agreements: Convention on the Conservation of Migratory Species of Wild Animals (Bonn Convention, CMS), ASCOBANS (Agreement on the Conservation of Small Cetaceans of the Baltic and North Seas), Convention on the Conservation of European Wildlife and Natural Habitats (Bern Convention).
Aspect: Assessment of occurrence
Criteria: Population, population changes/trends based on large-scale surveys, distribution patterns and density distributions.
Aspect: Assessment of spatial units
Criteria: Function and importance of the German EEZ as well as the areas and other energy production areas identified in the FEP for marine mammals as a migration area, feeding or breeding ground.
Aspect: Preload
Criterion: Hazards due to anthropogenic influences and climate change.

Seabirds and resting birds

Aspect: Protection status
Criterion: Status according to Annex I species of the Birds Directive, European Red List of BirdLife International
Aspect: Assessment of occurrence
Criteria: Stock of the German North Sea, German Baltic Sea and German EEZ, large-scale distribution patterns, abundances, variability
Aspect: Assessment of spatial units
Criteria: Function of the areas and other energy production areas identified in the FEP for relevant breeding birds, migratory birds, as resting areas, location of the protected areas.
Aspect: Preload
Criterion: Hazards due to anthropogenic influences and climate change.

Migratory birds

Aspect: Large-scale importance of bird migration
Criterion: Guidelines and concentration areas
Aspect: Assessment of occurrence
Criterion: migratory activity and its intensity
Aspect: Rarity and endangerment
Criterion: Number of species and endangerment status of the species involved according to Annex I of the Birds Directive, 1979 Bern Convention on the Conservation of European Wildlife and Natural Habitats, 1979 Bonn Convention on the Conservation of Migratory Species of Wild Animals, AEWA (African-Eurasian Waterbird Agreement) and SPEC (Species of European Conservation Concern).
Aspect: Preload
Criterion: Existing pressures/ hazards due to anthropogenic influences and climate change.

4.4 Consideration of climate change

Anthropogenic climate change as one of the greatest societal challenges is of particular importance for changes in the oceans and their use. In changing seas, the consideration and integration of climate impacts into planning processes is of great importance in order to develop sustainable and future-oriented plans in the long term.

Climate change will alter the physical, chemical and biological conditions in the North Sea and Baltic Sea. This will inevitably have an impact on marine ecosystems, their structure and functions, which may also change ecosystem services. The changes may also have a direct impact on uses, e.g. for renewable energy (Frazão Santos et al. 2020).

The provisions of the FEP have a considerable CO_2 reduction potential and contribute in particular to climate protection. The expansion and use of climate-friendly technologies in the sea supports energy security and the achievement of national and international climate protection goals.

4.5 Assumptions for the description and assessment of the likely significant impacts

The description and assessment of the likely significant effects of the implementation of the FEP on the marine environment are carried out separately for areas and surfaces, platforms, submarine cable systems and other energy production areas on the basis of the protected goods, including the status assessment described above. For each of these aspects, it is examined individually whether additional or different significant environmental impacts arise compared to the SEA for the existing FEP or the SEA for the ROP and whether updates and deepening of the descriptions and assessments are required. The following table lists, based on the main impact factors, the potential environmental impacts that may arise from the respective use and form the basis for the assessment of the likely significant environmental impacts. For the assessment, the impacts are differentiated according to whether they are due to construction/deconstruction or operation, or whether they are caused by the facility itself.

Table 1 Overview of potentially significant impacts if the FEP is implemented.

Use	Effect	Potential impact	Protected goods															
			Benthos	Fish	Seabirds and resting birds	Migratory birds	Marine mammals	Bats	Plankton	Biotope types	Biodiversity	Floor	Area	Water	Air	Climate	Man/ Health	Cultural and material	Landscape
Areas, land and platform sites, other energy production areas	Placement of hard substrate (foundations)	Habitat modification	x	x			x		x	x	x	x							
		Habitat and land loss	x	x			x			x	x	x	x					x	
		Attraction effects, increase in species diversity, change in species composition	x	x	x		x		x		x								
		Change in hydrographic conditions	x	x			x		x	x				x				x	
	Scouring/sediment shift	Habitat modification	x	x					x	x		x	x					x	
	Sediment resuspension and turbidity plumes (construction phase)	Impairment	x t	x t	x t				x t					x t					
		Physiological effects and chilling effects		x t			x												
	Sediment resuspension and sedimentation (construction phase)	Impairment	x t	x t					x t					x t					
	Noise emissions during pile driving (construction phase)	Impairment/ scare effect		x t			x												
		Potential disruption/damage		x t			x												
	Visual disturbance due to construction operations	Local scouring and barrier effects		x t	x t														
	Obstacle in airspace	Scare effects, habitat loss			x														
		Barrier effect, collision			x	x		x											x
	Light emissions (construction and operational phase)	Attraction effects, collision			x	x		x											x
	Wind farm-related shipping traffic (maintenance, construction traffic)	Impairment/ scare effects Collision		x	x	x	x	x	x		x	x	x t	x	x	x	x	x	
	Material emissions (construction and operational phase)	Potential disturbance / damage												x					

Use	Effect	Potential impact	Protected goods															
			Benthos	Fish	Seabirds and resting birds	Migratory birds	Marine mammals	Bats	Plankton	Biotope types	Biodiversity	Floor	Area	Water	Air	Climate	Man/ Health	Cultural and material goods	Landscape
Submarine cable systems	Cable laying Cable trench and working strip	Disturbance of near-surface sediments	x							x		x	x					x	
		Impairment	x							x									
	Placement of hard substrate (rock fill)	Habitat modification	x	x					x	x		x						x	
		Habitat and land loss	x	x						x		x	x					x	
	Heat emissions	Impairment/displacement of cold-water-loving species	x								x	x							
	Magnetic fields	Impairment	x																
		Impairment of the orientation behaviour of individual migratory species		x															
	Turbidity plumes (construction phase)	Impairment	x t	x t	x t				x t					x t					
		Physiological effects and displacment effects		x t															

[t] temporary effects

In addition to the effects on the individual protected goods, cumulative effects and interactions between protected goods are also examined.

4.5.1 Cumulative assessment

§ Article 40(2), first sentence, lists the information that the environmental report must contain. As an implementation of Directive 2001/42/EC, it must be taken into account in the specification of the requirements that, according to Annex II of Directive 2001/42/EC, the cumulative character of the effects is also to be considered as criteria for the significance of effects on the sites.

The temporally and/or spatially related, cumulative effects can be considered for a single use or for the interaction of several uses. The effect of different uses or different effects of a use can have synergistic, antagonistic or additive effects on the state of the ecosystem (Foden et al. 2010, Brown, et al. 2013, Stelzenmüller et al. 2018). Cumulative impacts are therefore not necessarily the sum of all individual impacts, but can also be smaller or larger than their sum.

The focus in the environmental report on the FEP is on the cumulative consideration of similar uses, namely those for which the FEP makes determinations (Figure 9). A cumulative consideration of different uses, i.e. intersectoral, is carried out within the framework of the SEA at the higher level of the ROP for the EEZ.

With a view to accelerated expansion, the cumulative impacts of offshore wind energy on the marine environment as a whole need to be better understood.

This is necessary in order to exclude any risk to the marine environment, to comply with species protection and site protection requirements, and to order mitigation and avoidance measures for the realisation of future projects or to accompany compensatory measures for existing offshore wind energy.

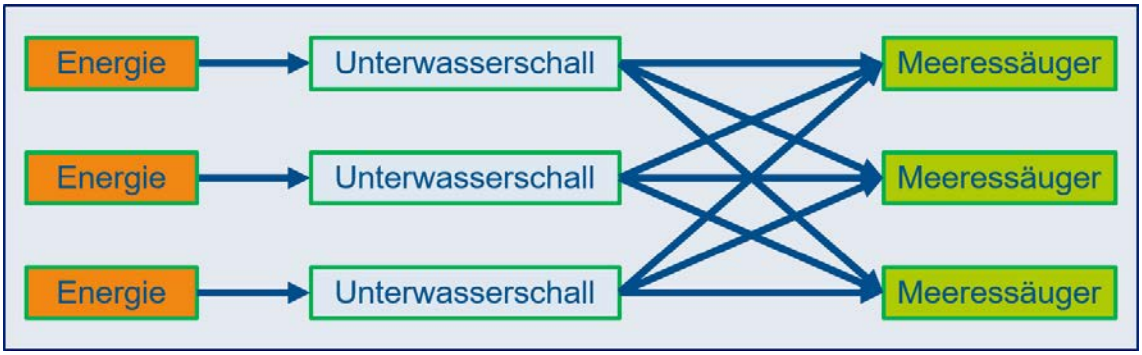

Illustration 9Exemplary cumulative effect of similar uses, here using the example of the construction of several wind turbines at the same time.

An assessment of the determinations has so far been carried out on the basis of the current state of knowledge within the meaning of § 39 para. 2 sentence 2 UVPG. The position paper on the cumulative assessment of loon habitat loss in the German North Sea (BMU 2009) and the noise protection concept of the BMU (2013) form an important assessment basis for the assessment of impacts due to habitat loss and underwater noise.

4.5.2 Interactions

In general, impacts on a protected good lead to various consequences and interactions between the protected goods. The essential interconnection of the biotic protected goods exists via the food chains. Due to the variability of the factors naturally affecting the individual protected goods and the different temporal and spatial resolution of the data available for the observation of the individual protected goods, interactions between the individual ecosystem components can only be identified and related to the effects of the plan to a very limited extent. Therefore, the description has so far been mainly verbal-argumentative based on findings from the literature.

4.5.3 Specific assumptions for the assessment of the likely significant environmental impacts (model parameters)

In detail, the analysis and examination of the respective determinations is carried out as follows:

Areas and surfaces, including the expected power to be installed:

With regard to the areas, it is currently assumed that all priority and reserved areas for offshore wind energy in the ROP will be identified in the FEP. If additional areas are identified, these will be included in the scope of the SEA. Within the areas, the FEP will define areas and the expected capacity of offshore wind turbines to be installed.

For a consideration of protected goods in the SEA, certain parameters are assumed for the development of the areas. In detail, these include the number of turbines, power per turbine [MW], hub height [m], height of the lower rotor tip [m], rotor diameter [m], total height [m] of the turbines, diameter of foundation types [m] and diameter of the scour protection [m].

The input parameters considered in the upcoming SEA are, in particular:

- Wind turbines already in operation or in the approval procedure (as reference and pre-pollution)
- Forecast of certain technical developments and assumptions of bandwidths for various parameters for the consideration of the defined areas and surfaces.

Table 2 provides an overview of the parameters to be used with the respective bandwidths. In order to reflect the range of possible developments, the assessment is essentially based on two scenarios. In the first scenario, many small installations are assumed and, in contrast, a few large installations are assumed in the second scenario. Due to the bandwidth thus covered, a description and assessment that is as comprehensive as possible in terms of the protected goods is made possible.

The parameters of the scenarios reflect the expected advancing state of the art and therefore differ for the different zones that are expected to be developed for offshore wind energy.

Table 2: Model parameters for the consideration of the areas and surfaces (for the allocation of the zones see Figure 10: Overview of FEP zones.; Update for diameter of foundation and scour protection according to (Hoffmann et al. 2022).

Parameter*	Zones 1 and 2		Zones 3 to 5	
	Scenario 1	Scenario 2	Scenario 1	Scenario 2
Capacity per plant [MW]	5	15	15	30
Hub height [m]	100	150	150	210
Rotor diameter [m]	140	240	240	350
Total height [m]	170	270	270	385
Diameter foundation monopile [m]	6,7	10,6	11,3	14-18
Diameter scour protection monopile [m]	30	48	51	63-81

* For wind farms in zone 2 that go into operation after 2029, the parameters of zones 3 to 5 apply.

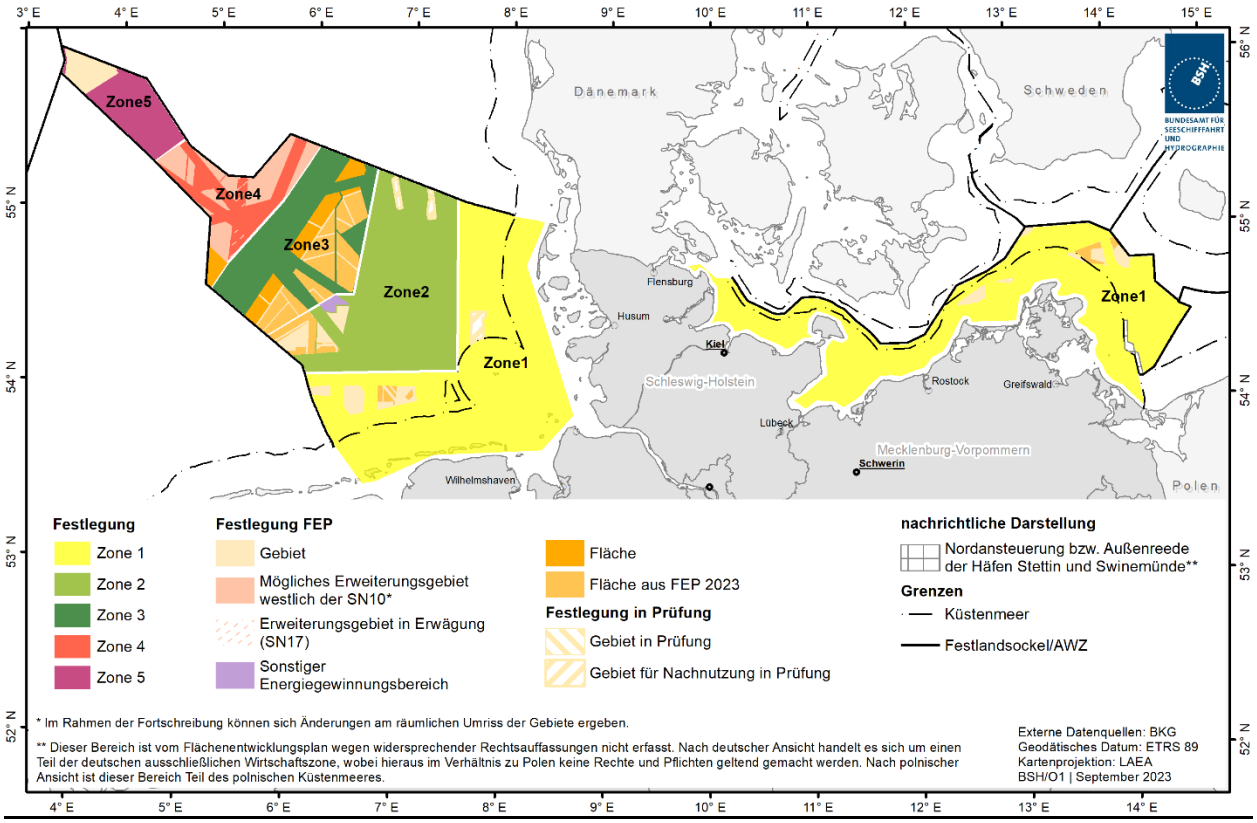

Figure 10 Overview of FEP zones.

Locations for platforms (transformer or residential platforms)

For the assessment of platform locations (transformer, converter and residential platforms), certain parameters are also assumed as a basis for the evaluation, such as the number of platforms, the length of the cabling within the park [km], the diameter of one or more foundations [m] and the area for foundations (incl. scour protection) [m²].

Table 3: Parameters for the consideration of grid connections and platforms

Mains connection	320 kV		525 kV		220 kV
Converter platforms, Transformer/residential platforms*	66 kV	155 kV	66 kV	132 kV	
Spec. length park-internal cabling [km/MW]	approx. 0.12	approx. 0.12	approx. 0.12	approx. 0.09	approx. 0.12
Number of converter platforms	1	1	1	1	0
Area of foundation for converter platform incl. scour protection [m²]	approx. 11,500 (Platform area approx. 105m + 56m)	approx. 11,500	approx. 11,500	approx. 11,500	
Number of transformer platforms	0	2	0	0	1
Number of residential platforms	2	0	2	2	0
Diameter foundation [m]**	approx. 2 x 10	approx. 2 x 10	approx. 2 x 10	approx. 2 x 10	approx. 10
Diameter scour protection [m]	approx. 2 x 50	approx. 2 x 50	approx. 2 x 50	approx. 2 x 50	approx. 50

* The information on transformer/residential platforms refers to the number of transformer/residential platforms per grid connection (only for completions from 2026) for the different connection concepts. Only the length of the cabling within the park depends on the expected power to be installed in the respective area and was determined on the basis of existing plans.

** The calculation of the land use is based on the assumption of a monopile foundation. It is assumed that the monopile and the jacket each have approximately the same total land use on the seabed.

Questions for the consultation

The specific length of the cabling within the park was assumed to be approximately 0.12 km/MW at 66 kV. It is assumed that this will be reduced as the voltage level is increased. The current assumption for 132 kV was based on a reduction of approx. 25% compared to the 66 kV concept.

Q.14 What specific length of in-park cabling (in km/MW) do you consider realistic if the raised voltage level of 132 kV is implemented?

Routes and route corridors for submarine cable systems

When determining routes and route corridors for submarine cable systems (connection lines, interconnectors and interconnections), certain widths of the cable trench [m] and a certain area of the crossing structures [m^2] are assumed. Mainly the construction, operation and repair-related environmental impacts are considered.

Table 4: Parameters for the consideration of the submarine cable systems

Submarine cable systems		
Cable trench width [m]		approx. 1
Area of crossing structures North Sea [m]^2		approx. 900
Area of the Baltic Sea crossing structures [m²].		approx. 750

Other energy production areas

For the definition of "other energy generation areas", a "classic" offshore wind farm is assumed within the framework of the strategic environmental assessment, based on the findings to date with regard to electricity generation. Environmental impacts beyond this are highly dependent on the respective use variant and should therefore be comprehensively assessed at the approval level. In this respect, the SEA for other energy generation areas is carried out analogously to the assessment of areas for offshore wind energy and is based on the same model parameters.

Relevant planning and technical principles

By regulating planning and technical principles in the FEP, the required land use can be minimised and the potential environmental impacts reduced to a low level. The majority of the planning principles serve to avoid or reduce environmental impacts and are not expected to lead to significant impacts.

The FEP also contains some planning principles that are not related to the reduction of environmental impacts. If these are based on spatial planning objectives, they must be complied with due to the binding nature of the spatial planning objectives. Remaining planning principles are examined for likely significant environmental impacts on protected assets.

With regard to the technical principles, the specification of a direct current system as a self-guided high-voltage direct current transmission with a voltage level of +/- 320 kV was already carried out within the framework of the Federal Sectoral Plan Offshore (BFO) North Sea and was thus also the subject of the environmental assessment of the BFO. Changes to the standard transmission capacity, for example, will be examined in the environmental report.

5 Data basis

The basis for the SEA is a description and assessment of the state of the environment in the study area. All protected goods are to be included. The data basis is the basis for the assessment of the likely significant environmental impacts, the site and species protection assessment and the alternatives assessment.

Pursuant to Section 39 (2) sentence 2 UVPG, the environmental report shall contain the information that can be ascertained with reasonable effort, taking into account the current state of knowledge and public statements known to the authority, generally accepted assessment methods, the content and level of detail of the plan and its position in the decision-making process.

According to Section 40 (4) UVPG, information available to the competent authority from other procedures or activities may be included in the environmental report if it is suitable for the intended purpose and sufficiently up-to-date.

The environmental report will again link to the environmental assessments carried out as part of the ROP and for the preparation and updates of the FEP from 2019, 2020 and 2023.

The environmental report will, on the one hand, update the description and assessment of the current state of the environment compared to the existing environmental reports on the FEP and the SEA on the ROP. On the other hand, it will forecast and assess the likely significant additional or different environmental effects caused by the implementation of the plan.

The descriptions and assessments are carried out with regard to the following protected goods:

- Area use
- Water
- Plankton
- Biotope types
- Benthos
- Fish
- Marine mammals
- Avifauna (seabirds and resting birds, migratory birds)
- Bats
- Biodiversity
- Air
- Climate
- Landscape
- Cultural heritage, other material assets
- People, especially human health
- Interactions between protected goods.

5.1 Overview of data and knowledge base

The data and knowledge situation has improved significantly in recent years, in particular due to the extensive data collection within the framework of environmental impact studies as well as construction and operation monitoring for offshore wind farm projects and the accompanying ecological research.

In general terms, the following data and findings are used as a basis for the environmental report:

- Results from the preliminary land use study (cf. data portal preliminary land use study - PINTA)
- Data and findings from approval procedures for offshore wind farms, submarine cable systems
- Data and findings from the operation of offshore wind farms
- Results from the monitoring of Natura 2000 sites
- Mapping instructions for §30 biotope types
- Environmental Report on the 2021 Maritime Spatial Plan for the German Exclusive Economic Zone in the North Sea
- Environmental Report on the Maritime Spatial 2021 for the German Exclusive Economic Zone in the Baltic Sea
- BfN (2017, 2020): Marine Protected Areas in the German Exclusive Economic Zone of the North Sea - Description and Status Assessment

- BfN (2017): Methodology of management planning for protected areas in the German Exclusive Economic Zone of the North Sea and Baltic Sea
- Geodata portal of the BSH (cf. GeoSeaPortal)
- MSFD Initial and Progress Assessment
- OSPAR status reports
- Findings and results from R&D projects commissioned by the BfN and/or the BSH and from accompanying ecological research
- Results from EU cooperation projects, such as PanBalticScope and SEANSE
- Project results FABENA
- Procedural instruction for dealing with underwater cultural heritage
- Studies/ Technical literature
- Current Red Lists
- Comments from the specialist authorities
- Comments from the (specialist) public

5.2 Indications of difficulties in compiling the documents

Pursuant to Article 40 para. 2 sentence 1 no. 7 UVPG, indications of difficulties encountered in compiling the information, for example technical gaps or lack of knowledge, must be presented. There are still gaps in knowledge in places, particularly with regard to the following points:

- Long-term effects from the operation of offshore wind farms and associated facilities, such as converter platforms
- Data for assessing the environmental status of the various protected goods for the area of the outer EEZ.

In principle, forecasts on the development of the living marine environment after implementation of the FEP remain subject to certain uncertainties. There is often a lack of long-term data series or analytical methods, e.g. for the intersection of extensive information on biotic and abiotic factors, in order to better understand complex interactions of the marine ecosystem.

In particular, there is no complete area-wide sediment and biotope mapping including their typical benthic communities outside the nature conservation areas of the EEZ. As a result, there is no scientific basis for assessing the impacts of the possible use of strictly protected biotope structures. Currently, such a mapping is being carried out on behalf of the BfN and in cooperation with the BSH, research and university institutions as well as an environmental office with a spatial focus on a gap closure in the nature conservation areas of the offshore areas of the EEZ. Significant progress is expected within the next three years.

In addition, scientific assessment criteria are lacking for some protected goods, both with regard to the assessment of their status and with regard to the impacts of anthropogenic activities on the development of the living marine environment, in order to fundamentally consider cumulative effects both temporally and spatially.

Various R&D studies on assessment approaches, including for underwater noise, are currently being prepared on behalf of the BSH. The projects serve the continuous further development of a uniform, quality-tested basis of marine environmental information for the assessment of possible impacts of offshore installations.

The environmental report will make substantial reference to the environmental report on the ROP and the environmental report on the FEP 2023 for the presentation of specific information gaps or difficulties in compiling the documents for the individual objects of protection and update these as necessary.

6 Presentation of the individual assessment steps in the environmental report

The description and assessment of the environmental status, the presentation of the likely development in the event of non-implementation of the plan and the assessment of the likely significant environmental effects draw on the specifications of the FEP and compare these in each case with the assessments already carried out as part of the SEA for the FEP and the ROP.Description and assessment of the state of the environment

Pursuant to Section 40 (2) sentence 1 no. 3 UVPG, the environmental report contains a presentation of the characteristics of the environment and the current state of the environment in the SEA study area. Compared to the existing strategic environmental assessments for the FEP and the ROP, this is to be limited to additional or other significant environmental impacts as well as to necessary updates and deepening.

The description of the current state of the environment is fundamentally necessary in order to be able to forecast changes in it during implementation of the plan. The subject of the inventory are the protected goods listed in Article 2 (1) Nos. 1 to 4 UVPG as well as interactions between them. The presentation is problem-oriented. Emphasis is therefore placed on possible existing pressures, environmental elements requiring special protection, and on those protected assets that will be more strongly affected by the implementation of the plan. In spatial terms, the description of the environment is based on the respective environmental impacts of the plan. These vary in extent depending on the type of impact and the protected property concerned, and may extend beyond the boundaries of the plan.

6.1 Expected development in the event of non-implementation of the plan

For a comprehensive forecast of the environmental impacts associated with the FEP, it must also be known how the environment would likely develop if the plan were not implemented. In the context of this consideration, it is above all relevant that offshore wind energy would be expanded within the EEZ even without updating the plan. This requires the fulfilment of the climate protection and energy policy goals of the German government, for which the expansion of offshore wind energy plays a key role. This is also reflected in the statutory expansion targets for offshore wind energy (§ 1 para. 2 sentence 1 WindSeeG). According to the explanatory memorandum to the WindSeeG, there are no alternatives (BT-Drs. 20/1634, p. 60). The Act is necessary to achieve Germany's ambitious expansion targets for offshore wind energy as an essential contribution to the climate targets.

Against this background and in view of the drastic consequences of climate change - also for the state of the marine environment - which would have to be expected if the climate protection targets were not achieved, the assumption of a zero variant, in which development is assumed without additional expansion of offshore wind energy, is unrealistic.

In order to be able to comply with the expansion targets stipulated in § 1 para. 2 sentence 1 WindSeeG, the construction of offshore wind turbines is necessary and, as described above, no viable alternatives are currently apparent with which the climate protection targets could otherwise be achieved. Accordingly, the legislator has weighed up the impacts on the marine environment caused by the legally stipulated expansion targets for offshore wind energy against the achievement of the climate protection targets within the framework of the expansion targets pursuant to § 1 para. 2 sentence 1 WindSeeG in favour of the orderly expansion of

wind energy until greenhouse gas neutrality is achieved, § 1 para. 3 WindSeeG.

As a result of this decision, the FEP serves the spatially and temporally ordered and efficient development of offshore wind energy, with a series of additional regulations designed to minimise the impact on the marine environment of the North Sea.

The likely development if the plan is not implemented therefore includes a comparison with the environmental effects with an identical time horizon without an updated FEP, but not a comparison of the environmental effects of the plan with the current environmental status. The starting point for the forecast of the likely development in the event of non-implementation of the plan will essentially be the environmental assessment of maritime spatial planning.

6.2 Description and assessment of the likely significant effects of plan implementation on the marine environment

The description and assessment of the environmental impacts concentrates on the assets for which significant impacts cannot be ruled out from the outset through the implementation of the FEP. The description and assessment of the environmental impacts will focus on additional or other significant environmental impacts as well as on the effects of the implementation of the FEP. The description and assessment will be limited to additional or other significant environmental impacts as well as to necessary updates and deepening compared to the existing strategic environmental assessments for the FEP and the ROP. In addition to the significant negative impacts, possible positive effects on the marine environment will also be assessed on the basis of the standards of the sectoral legislation, i.e. § 5 para. 3 sentence 2 no. 2 WindSeeG and national nature conservation legislation. Overall, the protected interests listed in Article 2 (1) UVPG are examined.

Biotope protection assessment

The specifications of the FEP must also comply with the requirements of biotope protection law. § Section 72 (2) of the WindSeeG provides the following with regard to the statutory biotope protection of Section 30 of the Federal Nature Conservation Act: Section 30 (2) sentence 1 of the Federal Nature Conservation Act shall be applied to projects under the WindSeeG with the proviso that significant impairment of biotopes within the meaning of Section 30 (2) sentence 1 of the Federal Nature Conservation Act shall be avoided as far as possible. § Section 30 para. 2 sentence 1 no. 6 BNatSchG stipulates prohibitions with regard to possible destruction or other significant impairment of marine macrophyte stocks, reefs, sublittoral sandbanks, mudflats with bottom-dwelling megafauna and species-rich gravel, coarse sand and shingle beds in the marine and coastal areas.

Species protection assessment

The environmental report also presents the assessment of the species protection requirements. The assessment will be limited to additional or other significant environmental impacts as well as to necessary updates and deepening compared to the existing strategic environmental assessments for the FEP and the ROP.

Special regulations with prohibitions apply to animals of specially or strictly protected species. According to § 44 para. 1 no. 1 BNatSchG, wild animals of specially protected species may not be injured or killed. Wild animals of strictly protected species and European bird species may not be significantly disturbed during the breeding, rearing, moulting, hibernation and migration periods according to § 44 para. 1 no. 2 BNatSchG.

Examination of the legal framework governing the conservation of natural habitats

As part of the SEA, the areas, sites, platforms and planned grid connections planned in the FEP will also be assessed separately for their

compatibility with the conservation purposes of the nature conservation areas. The assessment will be limited to additional or other significant environmental impacts as well as to necessary updates and deepening compared to the existing environmental assessments of the FEP and the ROP.

The nature conservation areas "Sylter Außenriff - Östliche Deutsche Bucht", "Borkum Riffgrund" and "Doggerbank" are located in the German EEZ of the North Sea and were established by ordinance of 22.09.2017.

In the German EEZ of the Baltic Sea, there are the nature conservation areas "Pomeranian Bay - Rönnebank", "Fehmarn Belt" and "Kadet Trench", which were established by ordinance of 22.09.2017.

The specifications of the plan shall be examined for their compatibility with the conservation purpose of the respective ordinance. They are permissible if, pursuant to section 36, first sentence, no. 2 in conjunction with section 34, subsection 2 of the Federal Nature Conservation Act, they cannot lead to significant impairments of the components of the nature conservation area relevant to the conservation purpose or if they meet the requirements of section 34, subsections 3 to 5 of the Federal Nature Conservation Act (cf. section 5, subsection 3, sentence 2, no. 5 of the WindSee Act).

Furthermore, the assessment under site protection law also takes into account the long-distance effects of the specifications made within the EEZ on the protected areas in the adjacent territorial sea and in the adjacent waters of the neighbouring states. This also applies to the assessment and consideration of functional relationships between the individual protected areas and the coherence of the network of protected areas pursuant to Article 56(2) of the Federal Nature Conservation Act, since the habitat of some target species (e.g. avifauna, marine mammals) may extend over several protected areas due to their large radius of action.

6.3 Principles of the alternatives assessment

Pursuant to Art. 5 para. 1 sentence 1 SEA Directive in conjunction with the criteria in Annex I SEA Directive and § 40 para. 2 sentence 1 no. 8 UVPG, the environmental report contains a brief description of the reasons for the choice of the reasonable alternatives examined. At the plan level, the conceptual/strategic design, spatial and technical alternatives play a role. The prerequisite is always that these are reasonable or can be seriously considered.

Thus, not all conceivable alternatives have to be examined. However, it is also no longer sufficient to identify, describe and assess only those alternatives that "seriously suggest themselves" or "even impose themselves". The duty to investigate thus extends to all alternatives that are "not obviously [...] remote" (Wulfhorst 2011). The alternatives assessment does not explicitly demand that particularly environmentally friendly alternatives be developed and examined. Rather, the alternatives that are "reasonable" in the above sense should be presented comparatively with regard to their environmental impacts, so that the consideration of environmental concerns becomes comprehensible when deciding on the alternative to be pursued further (Balla et al. 2009).

At the same time, the effort required to identify and examine the alternatives under consideration must be reasonable. The following applies: The greater the expected environmental impacts and thus the need for conflict management in planning, the more extensive or detailed investigations are required.

In addition to the zero alternative, the environmental report will examine in particular spatial and technical alternatives. Alternatives already examined in the previous FEP procedures, for which no updating or deepening is required, will not be repeated.

6.4 Measures to avoid, reduce and compensate for significant negative impacts of the land development plan on the marine environment

Pursuant to Section 40 (2) UVPG, the environmental report shall contain a description of the measures planned to prevent, reduce and, as far as possible, compensate for significant adverse environmental effects resulting from the implementation of the plan. Avoidance and mitigation measures form an essential basis for preventing significant impacts on the marine environment.

In addition, the provisions of the FEP are subject to a continuous optimisation process, as the insights gained on an ongoing basis during the SEA and consultation process are taken into account in the preparation of the plan.

While individual avoidance, mitigation and compensation measures can already start at the planning level, others only come into play during concrete implementation and are regulated there in the individual approval procedure on a project- and site-specific basis. The best avoidance and mitigation measure is an appropriate siting/selection of areas and sites. With regard to planning avoidance and mitigation measures, the FEP makes spatial and, with planning principles, textual stipulations which, in accordance with the environmental protection objectives set out, serve to avoid or reduce significant negative impacts of the implementation of the FEP on the marine environment. These mitigation and avoidance measures are specified and ordered by the competent licensing authority at project level for the planning, construction and operation phases and relate to the individual spatial determination types of § 5 para. 1 WindSeeG.

6.5 Planned measures to monitor the impact of the implementation of the land development plan on the environment

Pursuant to Article 40 (2), sentence 1, no. 9 UVPG, the environmental report also contains a description of the planned monitoring measures pursuant to Article 45 UVPG. Monitoring is necessary, in particular, to identify unforeseen significant impacts at an early stage and to be able to take appropriate remedial measures. The monitoring measures shall be determined on the basis of the information in the environmental report.

7 Sensitivity Mapping

As part of forward-looking planning, it is planned to take into account that the planned amendment to RED III will result in the designation of so-called "acceleration areas" in accordance with Art. 15c para. 1 lit. a RED III. For their nature-compatible designation, a sensitivity mapping pursuant to Art. 15c para. 1 lit a (iii) RED III is expected to be carried out within the SEA. This is intended to spatially depict the sensitivity of potential "acceleration areas" in the German EEZ to the impacts of the construction and operation of wind energy installations, in order to identify those areas in which no significant negative impacts are expected on the protected goods examined. Due to the current planning, the sensitivity mapping for the designation of nature-friendly "acceleration areas" initially focuses on the EEZ of the North Sea.

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